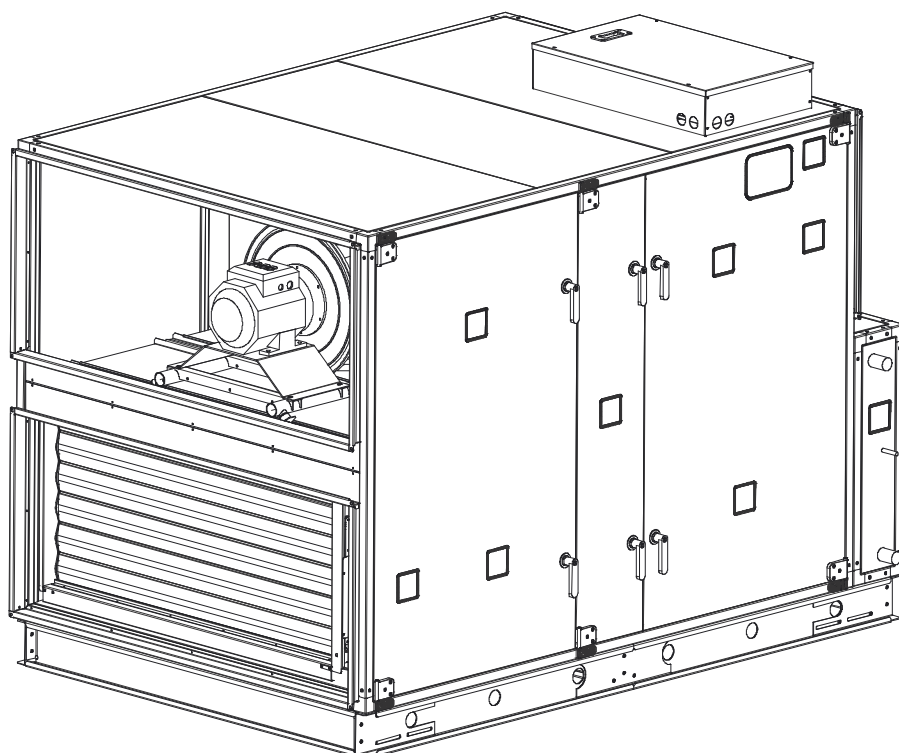


May 2015

Air Handling Units

Danvent DV

With control system



GB **User Manual**

Transport, installation, start-up and maintenance

Version 1.01.06

Master version for translated User Manuals

Original version for this air handling unit

This manual has part number 90925372

Detailed table of contents on the following pages

General description

- a. Manufacturer
- b. Name of machines
- c. Declaration of conformity - example
- d. General descriptions, dangers and warnings
- e. Drawings, diagrams, guides and instructions for use, maintenance, repairs
- f. Employees in charge of operation/control/maintenance
- g. Intended use and applications
- h. Unintended use and misuse – inappropriate applications for the machine

Installation

- i. Instructions for unloading on the site, installation and connection
- j. Installation and assembly instructions for reduction of noise and vibrations

Start-up, adjustments and operation

- k. Start-up, adjustments, use and commissioning
- l. Residual risks that remain
- m. Instructions on the protective measures during repair and maintenance
- n. Tools which may be fitted to the machinery

Machine stability

- o. Stability during use, transportation, assembly, dismantling when out of service
- p. Machinery where these are regularly to be transported

Breakdown

- q. Operating method in the event of breakdown. Safe restart.

Maintenance

- r. Adjustment and maintenance operations
- s. Adjustments and maintenance to be carried out safely
- t. Spare parts to be used, when these affect health and safety

Noise

- u. Information on airborne noise emissions exceeding 70 dB(A)²

Annexes

- 1. Declaration of conformity with production number (in separate cover)
- 2. Technical data – unique data for every unit (in separate cover)
- 3. Spare part list (in separate cover)
- 4. Assembly of base frame – height 150 mm for unit sizes 10 – 40
- 5. Assembly of base frame – height 150 mm for unit sizes 50 – 150
- 6. Assembly of base frame – height 250 mm for unit sizes 10 – 0
- 7. Assembly of base frame – height 250 mm for unit sizes 50 – 150
- 8. Installation of steel roof in the sizes 10-150
- 9. Rotary exchanger – speed control and assembly of divided rotor
- 10. Internal controller in the cooling compressor units – DVU and DVU-C
- 11. Menu for internal controller in the cooling compressor units - DVU and DVU-C
- 12. Connection of fan motor and set-up manual for Danfoss VLT FC101 frequency converter
- 13. Commissioning protocol – proposal (in separate cover)
- 14. Report with data from final functional test on the Systemair factory (in separate cover)
- 15. Short description of main components in the control system
- 16. Wiring diagram
- 17. Operator's guide (how to use the Systemair control panel) (in separate cover)

Contents

| | |
|--|-----------|
| A. MANUFACTURER | 12 |
| B. NAME OF MACHINES | 12 |
| C. DECLARATION OF CONFORMITY - EXAMPLE | 13 |
| D. GENERAL DESCRIPTIONS, DANGERS AND WARNINGS | 14 |
| d.1 Overview via pictograms on the inspection side of the unit | 14 |
| d.1.1 Where are pictograms placed on the units | 15 |
| d.1.2 CE label – example for DV unit | 16 |
| d.1.3 CE label – example for TIME unit | 16 |
| d.1.4 Pictogram on a door for a fan in a DV unit | 16 |
| d.1.5 Pictogram on a door for a fan in a TIME unit | 17 |
| d.1.6 Pictograms for all available functions in the units | 17 |
| d.1.7 Pictograms about warnings and dangers on the units | 18 |
| d.2 Data about the unit according to cards and labels in and on the unit | 19 |
| d.2.1 Machine card with unique data on every unit | 19 |
| d.2.2 Label with data about the cabinet | 20 |
| d.2.3 Flowchart – example of the label placed on or with the cabinet | 20 |
| d.2.4 Symbols in the flowchart and explanation about the symbols. | 21 |
| d.2.5 Example of label placed on or with the cabinet – Terminal plan for external components | 22 |
| d.3 Hand terminal (optional for DV units – always standard for TIME units) | 22 |
| d.4 Dimensions of the units – selected examples. | 23 |
| d.5 Ordinary automatically operation – only manual operation by new parameters. | 24 |
| d.6 Warnings about dangers | 24 |
| E. DRAWINGS, DIAGRAMS, GUIDES AND INSTRUCTIONS FOR THE USE, MAINTENANCE AND REPAIR | 24 |
| F. EMPLOYEES IN CHARGE OF OPERATION/CONTROL/MAINTENANCE | 25 |
| f1. Employees that take care of ordinary operation | 25 |
| G. INTENDED USE AND RANGE OF APPLICATIONS | 25 |

| | |
|---|-----------|
| H. UNINTENDED USE AND MISUSE – INAPPROPRIATE APPLICATIONS FOR THE MACHINE | 25 |
| h.1 Air handling unit in operation | 25 |
| I. INSTRUCTIONS FOR UNLOADING ON THE SITE AS WELL AS INSTALLATION AND CONNECTION | 26 |
| i.1. Unloading on the site | 26 |
| i.1.1 Unloading by fork-lift truck | 26 |
| i.1.2 Unloading by crane | 26 |
| i.1.3 Transport of unit without base frame on the site | 26 |
| i.1.4 Lifting a unit with straps | 26 |
| i.1.5 Lifting a unit with preinstalled brackets on the base frame for lifting. | 27 |
| i.1.6 Roof unit with bitumen roof | 27 |
| i.1.7 Roof unit with steel roof | 27 |
| i.1.8 Pre-assembly storage | 28 |
| i.1.9 Tilt less than 30° during transportation of the section with cooling compressor – DVU or DVU-C | 28 |
| i.2. Installation - mechanical | 28 |
| i.2.1 Free area in front of and above the unit | 28 |
| i.2.2 Supporting surface | 28 |
| i.2.3 Adjustable feet under legs or base frame and transport of sections | 28 |
| i.2.4 Base frame assembly | 28 |
| i.2.5 Base frames for outdoor units | 29 |
| i.2.6 Installation on the site of unit sections at the base frame when sections are delivered on pallets. | 29 |
| i.2.7 Joining the AHU sections | 31 |
| i.2.8 Fitting the ductwork | 32 |
| i.2.9 Risk of stack effect by vertical ducts and wind pressure on louvers | 32 |
| i.2.10 Refitting of guards | 32 |
| i.3. Installation - electrical | 33 |
| i.3.1 Description | 33 |
| i.3.2 Wiring diagrams | 33 |
| i.3.2.1 TIME units - labels on the cabinet next to the supply fan | 33 |
| i.3.2.2 DV units – labels on or with the cabinet | 33 |
| i.3.3 Installation of mains power supply | 33 |
| i.3.3.1 Necessary mains power supply for TIME units with ec motors and without DVU | 34 |
| i.3.3.2 Necessary mains power supply for DV units with cabinet/control system | 34 |
| i.3.3.3 Necessary overvoltage protection device, that leads lightning overvoltage to an earth lead on a safe way. | 34 |
| i.3.4 Electrical connection of components and functions | 34 |
| i.3.4.1 Connection of the Systemair Control Panel to the Corrigo E28 controller – software version 3.3 | 34 |
| i.4 Installation – Pipes for water – hot and chilled, valves and drains | 35 |
| i.4.1 Description | 35 |
| i.4.2 Pipe connections | 35 |
| i.4.3 Possibility of extracting components from the unit | 36 |
| i.4.4 Pipe connections to batteries | 36 |

| | |
|--|----|
| i.4.4.1 Heating coils | 36 |
| i.4.4.2 Cooling coils | 36 |
| i.4.4.3 Rigid pipe mounting brackets for valves, circulation pumps and pipe system | 36 |
| i.4.4.3.1 Pipe connection to heating coils | 36 |
| i.4.4.3.2 Pipe connection to cooling coils for chilled water | 37 |
| i.4.4.3.3 Valve motor and valve for heating | 38 |
| i.4.4.3.4 Valve motor and valve for cooling | 38 |
| i.4.5 Draining condensate water | 38 |
| i.4.6 Draining condensate water from plate heat exchanger | 38 |
| i.4.7 Draining condensate water from cooling battery | 38 |

J. INSTALLATION AND ASSEMBLY INSTRUCTIONS FOR REDUCTION OF NOISE AND VIBRATION EMISSIONS **39**

K. INSTRUCTIONS FOR PUTTING INTO SERVICE, ADJUSTMENTS, USE AND COMMISSIONING. **39**

k.1 Print-outs on paper **39**

k.2 Electronic media **39**

k.3 Documentation is available for download from <https://techdoc.systemair.dk> **40**

k.4 Start-up by installer **40**

| | |
|-------------------------------------|----|
| k.4.1 Checklist, relevant values | 40 |
| k.4.1.1 Checklist prior to start-up | 40 |
| k.4.1.2 Switch on power | 40 |

K.5 Adjustments and use **41**

K.6 Description of functions **41**

| | |
|--|----|
| K.6.1 Remote control | 41 |
| k.6.1.1 Communication WEB-master (TCP/IP Exoline) to PC and Android telephone | 41 |
| k.6.1.2 Communication to BMS systems with MODBUS | 41 |
| k.6.1.3 Communication to BMS systems with LON | 41 |
| k.6.1.4 Communication to BMS systems via BACnet | 41 |
| K.6.2 Extended operation and external start/stop (for example by presence detectors) | 41 |
| k.6.3 Valve and valve motor for heating coil | 42 |
| k.6.4 Valve and valve motor for cooling coil | 42 |
| k.6.5 DX cooling | 42 |
| k.6.6 Circulation pump, heating | 42 |
| k.6.7 Fire alarm function | 42 |
| k.6.7.1 External fire signal that indicate block or run | 42 |
| k.6.7.2 External fire signal | 42 |
| k.6.7.3 Two fire thermostats | 42 |
| k.6.7.4 One smoke detector in extract air | 42 |
| k.6.8 E tool - configuration tool | 42 |
| k.6.9 Electrical heater battery | 43 |
| k.6.9.1 Control of heating capacity connected to unit with Systemair control system | 43 |

| | |
|--|-----------|
| k.6.9.2 Control of heating capacity connected to unit without Systemair control system | 43 |
| k.6.10 Speed control of fans | 43 |
| k.6.10.1 TIME control system – EC motors | 43 |
| k.6.10.2 DV control system - frequency converters inside the unit are IP 20 | 43 |
| k.6.10.3 Pressure transmitters | 43 |
| k.6.10.4 CO2-dependent air flow | 43 |
| k.6.10.5 Humidity dependent air flow | 43 |
| k.6.11 Cabinet | 44 |
| k.6.11.1 Integrated cabinets in TIME units | 44 |
| k.6.11.2 Integrated cabinet in DV units with control system | 44 |
| k.6.11.3 Cabinet placed on the DV unit with control system | 44 |
| k.6.12 Temperature sensors | 44 |
| k.6.13 Damper motors | 44 |
| k.6.14 Filter guards | 44 |
| k.6.15 Room temperature sensors | 44 |
| k.6.16 Frost protection | 44 |
| k.6.17 Systemair Control Panel - SCP | 45 |
| k.6.18 Cooling recovery | 45 |
| k.6.19 Free cooling | 45 |
| k.6.20 Alarm signal | 45 |
| k.6.21 Heat recovery | 45 |
| k.6.22 Frost protection – plate heat exchanger | 45 |
| k.7 Commissioning | 45 |

L. INFORMATION ABOUT THE *RESIDUAL RISKS* THAT REMAIN DESPITE THE INHERENT SAFE DESIGN MEASURES, SAFEGUARDING AND COMPLEMENTARY PROTECTIVE MEASURES ADOPTED.

| | |
|---|-----------|
| I.1 Unit casing. | 45 |
| I.1.1. Design of the machine to make transport safe | 45 |
| I.2 Common for all unit sections | 46 |
| I.2.1 Risk caused by surfaces, edges and corners | 46 |
| I.3 Common for all unit sections by insufficient lighting | 46 |
| I.3.1 Risk caused by insufficient lighting inside sections | 46 |
| I.4 Dampers type DVA – DVB – DVM – DVP – Bypass dampers in DVQ | 46 |
| I.4.1 Risk caused by maintenance and cleaning of dampers | 46 |
| I.5 Attenuators type DVD | 46 |
| I.5.1 Risk caused by maintenance and cleaning of attenuators | 46 |
| I.6 Filters type DVG – DVF | 47 |
| I.6.1 Risk caused by missing change of filters | 47 |
| I.6.2 Risk caused by the execution of filter change | 47 |
| I.7 Plug fans type DVE | 47 |
| I.7.1 Risk caused by lightning strike | 47 |

| | |
|--|-----------|
| l.7.2. Risk caused by permanent magnet motor | 47 |
| l.7.3 Risk of rotating impeller caused by stack effect (chimney effect). | 48 |
| l.8 Batteries for heating and cooling type DVR – DVH – DVK, cooling compressor | 48 |
| l.8.1 Extreme temperatures - heating | 48 |
| l.8.2 Extreme temperatures - cooling | 48 |
| l.9 Cooling compressor units type DVU – DVU-C | 48 |
| l.9.1 Risk of high temperature | 48 |
| l.9.2 Risk caused by lightning strike | 49 |
| M. INSTRUCTIONS ON THE PROTECTIVE MEASURES TO BE TAKEN BY ALL SERVICE TECHNICIANS DURING REPAIR AND MAINTENANCE | 49 |
| N. THE ESSENTIAL CHARACTERISTICS OF TOOLS WHICH MAY BE FITTED TO THE MACHINERY | 49 |
| O. THE CONDITIONS OF STABILITY DURING USE, TRANSPORTATION, ASSEMBLY, DISMANTLING WHEN OUT OF SERVICE | 49 |
| o.1 Installed reliable to avoid units to be tilted or moved by the any storm. | 50 |
| o.2 Transport of section with cooling compressor unit | 50 |
| o.3 Disposal of the cooling compressor system - type DVU and DVU-C | 50 |
| o.4 General disassembly – sharp edges | 50 |
| P. INSTRUCTIONS FOR MACHINERY WHERE THESE ARE REGULARLY TO BE TRANSPORTED | 50 |
| Q. THE OPERATING METHOD TO BE FOLLOWED IN THE EVENT OF BREAKDOWN. SAFE RESTART. | 50 |
| R. ADJUSTMENT AND MAINTENANCE OPERATIONS | 51 |
| r.1 Shutdown of the unit to a safe state. | 51 |
| r.2 Recommended maintenance intervals | 52 |
| r.3. Filters – sizes and numbers | 53 |
| r.3.1 Bag filters | 53 |
| r.3.2 Panel filters | 54 |
| r.4. Changing the Internal Battery in the controller | 54 |
| r.5 Other functions to maintain | 54 |
| r.5.1 The unit | 54 |
| | 7 |

| | |
|--|----|
| r.5.2 Dampers | 55 |
| r.5.3 Rotary heat exchanger DVC | 56 |
| r.5.3.1 Rotor | 56 |
| r.5.3.2 Motor and belt drive | 56 |
| r.5.4 Cross flow and counter flow exchanger | 56 |
| r.5.4.1 By-pass damper | 57 |
| r.5.4.2 Condensate water drain | 57 |
| r.5.5 Run-around heat exchanger DVR | 57 |
| r.5.5.1 Pump and pressure expansion | 57 |
| r.5.5.2 Condensate water drain | 57 |
| r.5.6 Heating coil DVH, cooling coil DVK and change over coil DVHK | 57 |
| r.5.6.1 Heating battery | 58 |
| r.5.6.2 Cooling battery | 58 |
| r.5.6.3 Electric heating battery | 58 |
| r.5.7 Plug fans DVE | 58 |
| r.5.7.1 Motor | 58 |
| r.5.8 Silencer DVD | 58 |
| r.5.9 Outdoor air section DVY | 59 |
| r.5.10 Heat pump unit – DVU-HP | 60 |

S. INSTRUCTIONS DESIGNED TO ENABLE ADJUSTMENT AND MAINTENANCE TO BE CARRIED OUT SAFELY, INCLUDING THE PROTECTIVE MEASURES THAT SHOULD BE TAKEN DURING THESE OPERATIONS

61

| | |
|---|-----------|
| s.1. Protective measures and additional protective measures | 61 |
| s.1.1 Necessary protection measures prior to start-up. | 61 |
| s.1.1.1 Design of protection measures | 61 |
| s.1.1.2 Configuration of frequency converters with installed guard | 61 |
| s.1.2 Safe adjustment and maintenance | 61 |
| s.1.3 Personal protective equipment for maintenance staff – health and safety | 62 |

T. THE SPECIFICATIONS OF THE SPARE PARTS TO BE USED, WHEN THESE AFFECT THE HEALTH AND SAFETY OF OPERATORS

62

| | |
|-------------------------------------|-----------|
| t.1 Spare parts - Mechanical | 62 |
| t.2 Spare parts - Electrical | 62 |

U. INFORMATION ON AIRBORNE NOISE EMISSIONS EXCEEDING 70 DB(A)

62

OVERVIEW OF ANNEXES

63

| | |
|---|-----------|
| Annex 1 Declaration of conformity with unique production number. | 63 |
| Annex 2 Technical data – unique data for every unit | 63 |
| Annex 3 spare part lists | 63 |

| | |
|---|----------------|
| Annex 4 Assemble base frames – height 150 mm for units in the sizes 10-40 | 63 |
| Annex 5 Assemble base frames – height 150 mm for units in the sizes 50-150 | 63 |
| Annex 6 Assemble base frames – height 250 mm for units in the sizes 10-40 | 63 |
| Annex 7 Assemble base frames – height 250 mm for units in the sizes 50-150 | 63 |
| Annex 8 Installation of steel roof in the sizes 10-150 | 63 |
| Annex 9 Rotary exchanger – speed control and assembly of divided rotor | 63 |
| Annex 10 Heat pump unit – DVU-HP | 63 |
| Annex 11 Menu for internal controller in the heat pump unit | 63 |
| Annex 12 Connection of fan motor and set-up manual for Danfoss VLT FC101 frequency converter | 63 |
| Annex 13 Commissioning protocol – proposal (receipt for hand-over) | 63 |
| Annex 14 Report with data from the final functional test on the Systemair factory | 63 |
| Annex 15 Short description of main components in control system | 64 |
| Annex 16 Wiring diagram | 64 |
| Annex 17 Operator's guide (how to use the Systemair control panel) | 64 |
| ANNEX 4. ASSEMBLE BASE FRAMES – HEIGHT 150 MM FOR UNITS SIZES 10-40 | 4—1 |
| 4.1 Base frame length 720 – 2420 [mm] Unit size 10-40 | 4—2 |
| 4.2 Base frame length 2420 – 4590 [mm] Unit size 10-40 | 4—3 |
| 4.3 Base frame length 4590 – 6200 [mm] Unit size 10-40 | 4—4 |
| ANNEX 5. ASSEMBLE BASE FRAMES – HEIGHT 150 MM FOR UNITS SIZES 50-150 | 5—1 |
| 5.1 Base frame length 720 – 2420 [mm] Unit size 50-DV150 | 5—2 |
| 5.2 Base frame length 2420 – 4590 [mm] Unit size 50-150 | 5—3 |
| 5.3 Base frame length 4590 – 6200 [mm] Unit size 50-150 | 5—4 |
| ANNEX 6. ASSEMBLE BASE FRAMES – HEIGHT 250 MM FOR UNITS SIZES 10-40 | 6—1 |
| 6.1 Base frame length 720 – 2420 [mm] Unit size 10-40 | 6—2 |
| 6.2 Base frame length 2420 – 4590 [mm] Unit size 10-40 | 6—3 |
| 6.3 Base frame length 4590 – 6200 [mm] Unit size 10-40 | 6—4 |
| ANNEX 7. ASSEMBLE BASE FRAMES – HEIGHT 250 MM FOR UNITS SIZES 50-150 | 7—1 |
| 7.1 Base frame length 720 – 2420 [mm] Unit size 50-150 | 7—2 |
| 7.2 Base frame length 2420 – 4590 [mm] Unit size 50-150 | 7—3 |
| 7.3 Base frame length 4590 – 6200 [mm] Unit size 50-150 | 7—4 |
| ANNEX 8. INSTALLATION OF STEEL ROOF IN THE SIZES 10-150 | 8—5 |

| | |
|---|------|
| 8.1 Overview | 8—5 |
| 8.2 Mount rails. Units of size 10, 15, 20, and 25 | 8—5 |
| 8.3 Mount rails. Units of size 30 and units larger than size 30. | 8—6 |
| 8.4 Roof overhang along the long sides of the unit | 8—7 |
| 8.5 Calculation of the overhang at the ends of the unit. Mount overhang profile – G1. | 8—7 |
| 8.6 Foam bands between rails and roof plates – mount roof plates. | 8—10 |
| 8.7 Foam bands between roof plates | 8—10 |
| 8.8 Mount roof plates – some of them are overlapping by 2 ribs | 8—10 |
| 8.9 Mount overhang profile – G5 on the other end of the unit. | 8—10 |
| 8.10 Mount side profiles and corners along the edges of the roof to protect persons | 8—11 |
| 8.11 Apply sealing on plate joints to ensure water resistance. | 8—12 |

ANNEX 9. SPEED CONTROL FOR ROTOR AND ASSEMBLY OF DIVIDED ROTOR 9—1

| | |
|---|------|
| 9.1 Speed control | 9—1 |
| 9.1.1 Selection of correct signal via the 4 DIP switch levers | 9—1 |
| 9.1.2 Indication of operation mode via red and green LED as well as test of motor | 9—2 |
| 9.1.3 Copy of the label with information about connection of cables | 9—3 |
| 9.2 Assemble the Systemair casing for DV60, DV80, DV100, DV120 og DV150 | 9—4 |
| 9.3 Assemble divided rotor for DV 60, DV 80, DV 100, DV 120 og DV 150 | 9—8 |
| 9.4 Assemble divided rotor for DV 190 og DV 240 | 9—19 |
| 9.5 Installation of motor that turns rotor and sensor for rotation | 9—30 |

ANNEX 10. REVERSIBLE HEAT PUMP UNIT FOR COOLING AND HEATING 10—1

| | |
|---|-------|
| 10.1 DVU-HP section (reversible heat pump unit) | 10—1 |
| 10.1.1 DVU-HP – Heat pump circuit | 10—1 |
| 10.1.2 DVU-HP- Electrical documentation | 10—1 |
| 10.1.3 Control signals | 10—2 |
| 10.2 DVU-HP-internal controller for the compressor system | 10—2 |
| 10.3 Background illumination of the display | 10—2 |
| 10.4 Menu – drawing of the menu structure to guide the user | 10—2 |
| 10.5 The start display, Main menu | 10—3 |
| 10.6 Settings | 10—3 |
| 10.7 Service | 10—6 |
| 10.8 Manual operation | 10—7 |
| 10.8.1 Running hours | 10—8 |
| 10.9 Alarm | 10—8 |
| 10.9.1 Alarm | 10—8 |
| 10.9.2 Alarm Log | 10—8 |
| 10.9.3 Alarm reset | 10—8 |
| 10.10 Maintenance | 10—10 |
| 10.11 DVU-HP- Data | 10—10 |
| 10.12 Data plate | 10—10 |

ANNEX 11. MENU FOR INTERNAL CONTROLLER IN THE DVU-HP 11—12

ANNEX 12. CONNECTION OF FAN MOTOR AND SET-UP FOR FREKV. CONV. 12-1

| | |
|---|------|
| 12.1 Connection of fan motor | 12-1 |
| 12.2 Set-up for Danfoss FC101 for DV-units with AC motors | 12-2 |

| | |
|---|-------------|
| 12.3 AC-fan operation without thermistor for Danfoss FC101. | 12-4 |
| 12.4 Set-up Danfoss FC101 for DV-units with PM motors | 12-5 |
| ANNEX 13. COMMISSIONING | 13-1 |
| ANNEX 14. TEST REPORT | 14-1 |
| ANNEX 15. COMPONENTS | 15-1 |
| 15.1 DV units delivered in several sections | 15-1 |
| External components | 15-1 |
| 15.2 DV unit delivered assembled on base frame | 15-1 |
| External components | 15-2 |
| ANNEX 16. WIRING DIAGRAM | 16-2 |

a. Manufacturer

This User Manual covers all air handling units with control system delivered by Systemair A/S.

Manufacturer and supplier data:

Systemair A/S

Ved Milepælen 7

DK-8361 Hasselager

Responsible for documentation: Ulf Bang

b. Name of machines

This manual is about Systemair air handling units with control systems called DANVENT DV10, DANVENT DV15, DANVENT DV20, DANVENT DV25, DANVENT DV30, DANVENT DV40, DANVENT DV50, DANVENT DV60, DANVENT DV80, DANVENT DV100, DANVENT DV120, DANVENT DV150, DANVENT DV190 og DANVENT DV240.

c. Declaration of Conformity - example

The manufacturer:

Systemair A/S
Ved Milepælen 7
DK - 8361 Hasselager



Hereby declares that, air handling units of the flowing types:

Delivered with control system

DANVENT DV10, DANVENT DV15, DANVENT DV20, DANVENT DV25, DANVENT DV30, DANVENT DV40, DANVENT DV50, DANVENT DV60, DANVENT DV80, DANVENT DV100, DANVENT DV120, DANVENT DV150, DANVENT DV190 and DANVENT DV240.

TIMEec 10, TIMEec 15, TIMEec 20, TIMEec 25, TIMEec 30, TIMEec 40

Serial No: "YMMM-71800-X"

are manufactured and delivered in accordance with following directives:

| | |
|------------------------------|-------------|
| Machinery directive | 2006/42/EC |
| EMC – directive | 2004/108/EC |
| Low voltage directive | 2006/95/EC |
| Pressure equipment directive | 97/23/EC |
| European Standard | EN378 |

Equipment type: **DVU-series**

Consisting of: Compressor, evaporator and condenser

Verification and Assessment by:

Notified Body Bureau VERITAS CE0041 for PED
Bureau VERITAS UK, "Parklands", Wilmslow Road
Didsbury, Manchester M20 2RE

Module: A1
Certificate no: CE-0041-PED-
A1-SYA-001-10-DNK

The declaration is only valid, if the installation of the air handling unit is carried out according to the instructions delivered with the unit. The installer will be responsible for the CE marking and documentation, if any construction or functional changes are applied to the air handling unit.

Hasselager 24. June 2013







d. General descriptions, dangers and warnings

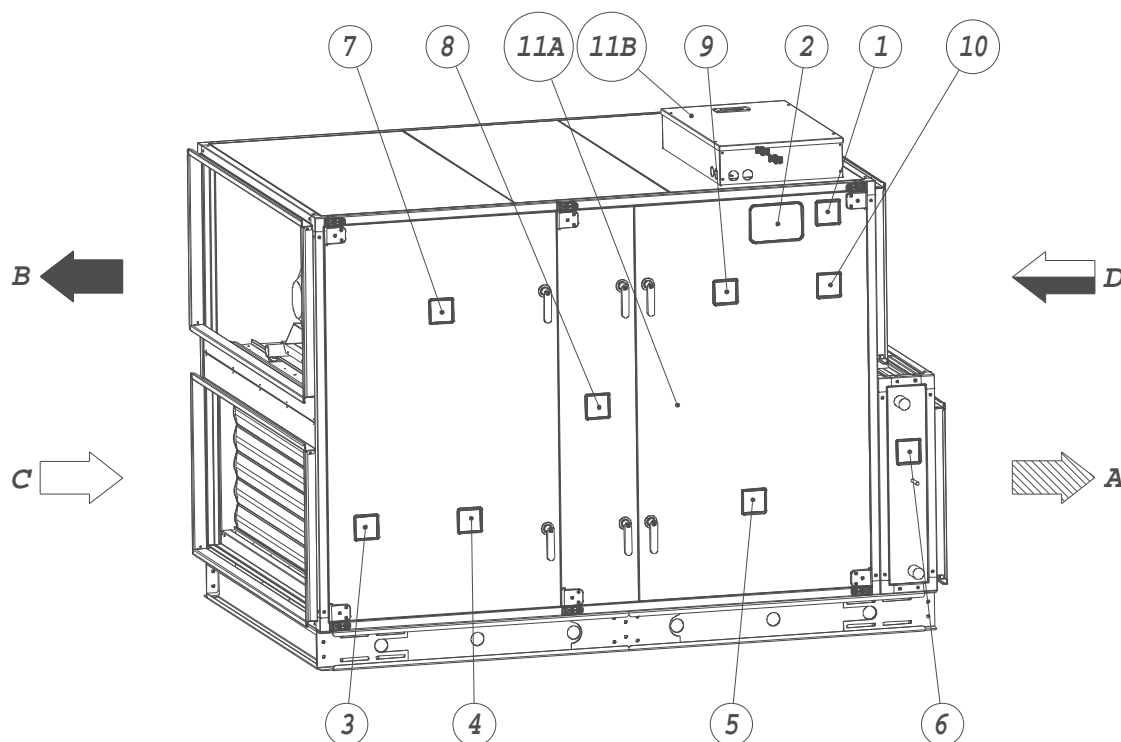
TIME and DV air handling units are order specific machines available in thousands of different configurations. Only a few examples of machine configurations are described below.
The air handling units are intended for the transport and treatment of air between -40 °C and + 40 °C
The units are exclusively for comfort ventilation.

Maintenance of the units must be carried out by skilled technicians.

On the drawing below, a right hand unit is shown because the inspection doors are mounted on the right hand side of the unit when looked in direction of SUPPLY airflow. The unit below is with rotary heat exchanger.

| Position | Description | Symbol |
|----------|--|---|
| A | Connection, supply air (to the rooms) |  |
| B | Connection, exhaust air |  |
| C | Connection, outdoor air in |  |
| D | Connection, extract air (from the rooms) |  |









d.1 Overview via pictograms on the inspection side of the unit



This is a right hand unit because the inspection doors are mounted on the right hand side of the unit when looked in direction of SUPPLY airflow.

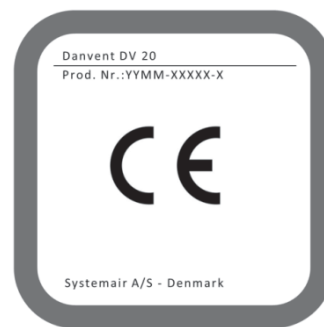
d.1.1 Where are pictograms placed on the units

Example (Symbols and descriptions of functions for fast identification)

| Position | Description | Symbol |
|----------|---|---|
| 1 | The CE label and the unique production number of this machine | CE |
| 2 | Machine card | |
| 3 | Damper - supply air |  |
| 4 | Filter - supply air |  |
| 5 | Fan- supply air |  |
| 6 | Heating battery - supply air |  |
| 7 | Fan - extract air |  |
| 8 | Rotary heat exchanger |  |
| 9 | Filter – extract air |  |
| 10 | Damper – extract air |  |
| 11A | 3 labels. One label with Flowchart, one label with terminal plan for external components and one label listing data about the cabinet. The labels are placed behind inspection doors, if the cabinet with control system is inside the unit. | |
| 11B | 3 labels. One label with Flowchart, one label with terminal plan for external components and one label listing data about the cabinet. The labels are placed on the cover of the cabinet, if the cabinet with control system is placed on the top of or on the front of the unit. | |

d.1.2 CE label – example for DV unit

This is the mandatory informations for the CE marking with;
Product name (in this example Danvent DV 20, where 20 informs about the size of the unit), Production number for the complete unit (in this example YYMM-xxxxx-x, where YYMM informs about year and month for the manufacture), xxxxx-x is the unique production number.



d.1.3 CE label – example for TIME unit

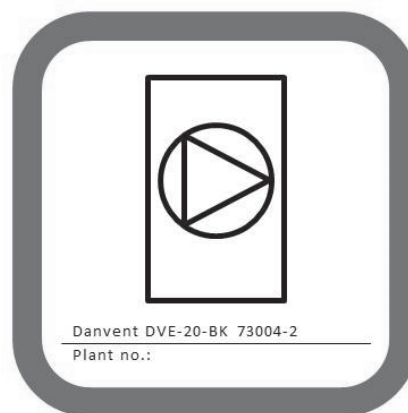
This is the mandatory informations for the CE marking with;

Product name (in this example TIME 40, where 40 informs about the size of the unit), Production number for the complete unit (in this example YYMM-xxxxx-1, where YYMM informs about year and month for the manufacture), xxxxx-1 is the unique production number.



d.1.4 Pictogram on a door for a fan in a DV unit

Example of the pictogram with the symbol for the function - fan, Systemair product name is DVE-20-BK where 20 informs about the size of the unit and BK is Backward Curved fan blades, production number for the complete unit (in this example 73004-2) and the customer's name for the unit, always written after – Plant no: _____








d.1.5 Pictogram on a door for a fan in a TIME unit

Example of the pictogram with the symbol for the function - fan, Systemair product name is this example is - Fan Supply, production number for the complete unit (in this example xxxxx-1) and the customer's name for the unit, always written after - Plant no: _____



d.1.6 Pictograms for all available functions in the units

| Id | Description | Symbol |
|-----|--|--------|
| DVA | Damper | |
| DVB | Damper | |
| DVM | Damper for mixing | |
| DVP | Damper for mixing | |
| DVG | Panel filter | |
| DVF | Bag filter | |
| DVC | Rotary heat exchanger | |
| DVQ | Plate heat exchanger (cross flow and counter flow) | |
| DVR | Run around heat exchanger | |
| DVH | Heating battery | |

| | | |
|-----|---|---|
| DVK | Cooling battery |  |
| DVU | Integrated cooling with compressor unit |  |
| DVE | Plug fan |  |
| DVD | Silencer |  |
| DVX | Humidifier |  |

d.1.7 Pictograms about warnings and dangers on the units

Pictograms according to EN1886 about



Warning about danger by rotating parts



Warning about danger by electricity



Warning about danger by heat

d.2 Data about the unit according to cards and labels in and on the unit

d.2.1 Machine card with unique data on every unit

An example of a machine card is shown below.

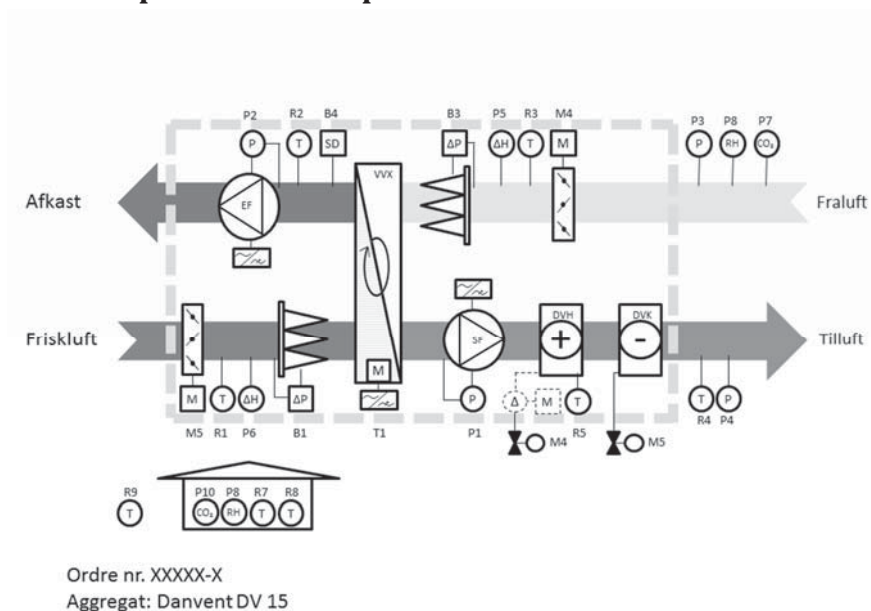
| | | | | |
|----------------------------|---------------|----------------|---|----------------|
| Type | DV-YY | | Systemair A/S | |
| Order number | XXXXX-X | | Ved Milepælen 7 | |
| | | | DK-8361 Hasselager | |
| | | | Tel. +45 87 38 75 00 | |
| | | | Email: mail@systemair.dk | |
| | Supply | Extract | | |
| Airflow | 10000 m3/h | 10000 m3/h | | |
| Total pressure drop | 686 Pa | 639 Pa | | |
| Heating | 31.00 kW | | | |
| Cooling | 57.14 kW | | | |
| Heat recovery | 82.7 % | | | |
| Heat recovery Capacity | 142.8 kW | | | |
| Fan | Supply | Extract | Data for cabinet | |
| Fan type | M-RH56Cpro | M-RH56Cpro | Ground for unit | TN-S |
| K-factor (p=1,2 kg/m3) | 308 | 308 | Current type | AC |
| Fan speed | 1415 RPM | 1385 RPM | Frequency | 50 Hz |
| Maximum fan speed | 1460 RPM | 1460 RPM | Mains supply | 3*400+N+PE VAC |
| Motor type | IE2 | IE2 | Ikmax | 16 kA |
| Motor norm size | ABB-100LD | ABB-100LD | Ikmin | 650 A |
| Motor speed | 1445 RPM | 1445 RPM | Max fuse | 25 A |
| Power | 3.0 kW | 3.0 kW | Min fuse | 10 A |
| Voltage | 3x400 V | 3x400 V | | |
| Filter | Supply | Extract | Sales agent: | |
| Filter class | F7 | F7 | Systemair Fans & Spares Ltd | |
| Dimensioning pressure drop | 130 Pa | 130 Pa | 72 Cheston Road, Birmingham, B7 5EJ | |
| Initial pressure drop | 71 Pa | 71 Pa | England | |
| Final pressure drop | 189 Pa | 189 Pa | Tel: + 44 (0) 121 322 0200 | |
| | | | http://www.systemair.co.uk | |

d.2.2 Label with data about the cabinet








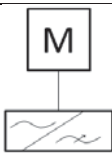
An example of the label that is always placed on or with the cabinet

| Systemair A/S | |
|--|--------------|
| Systemair declares hereby that the cabinet is in conformity with: | |
| SBB Low voltage panels: | N60439-1 |
| Electrical material on machines: | EN60204-1 |
| EMC-directive environment: | 89/336/EOF |
| Diagram version | DV ver. 2.11 |
| Systemair order number | 72800-1 |
| Unit size | DV 10-150 |
| Cabinet data: | |
| System ground | TN-S |
| Current type | AC |
| Frequence | 50 HZ |
| Rated voltage | 3*400 |
| Control voltage | V+N+PE VAC |
| IK max | 24 VDC |
| IK min | 6 kA |
| Max fuse | 650 A |
| Min fuse | 25 |
| Cable colors: | |
| Protection circuit | Green/yellow |
| 230 VAC phase | Black |
| 0 VAC neutral | Blue |
| 24 VDC | Grey |
| 0 VDC | Grey |
| Analog/digital | Grey |

d.2.3 Flowchart – example of the label placed on or with the cabinet



d.2.4 Symbols in the flowchart and explanation about the symbols.

| Id | Description | Symbol |
|-------------|--|---|
| RX | Temperature sensor - PT1000 |  |
| MX | Damper motor - on/off |  |
| MX | Damper motor – 0-10V |  |
| BX | Filter guard - digital |  |
| PX | Pressure transmitter – 0-10V |  |
| PX | Sensor for relative humidity – 0-10V |  |
| PX | Sensor for CO ₂ – 0-10V |  |
| T110 | Controller for rotary heat exchanger – 0-10V |  |

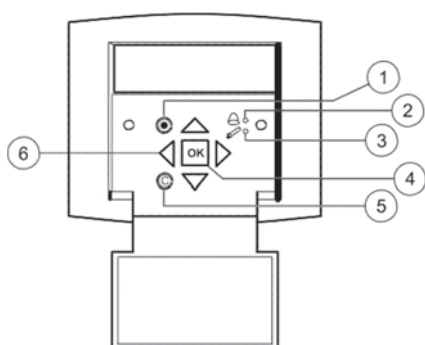
d.2.5 Example of label placed on or with the cabinet – Terminal plan for external components

| Product Description | Product Terminal | Cable | Wire | Switchboard Terminal |
|---------------------------|------------------|-------|------|----------------------|
| Main power | | W1000 | L1 | X1:L1 |
| | | | L2 | X1:L2 |
| | | | L3 | X1:L3 |
| | | | N | X1:N |
| | | | G/G | X1:PE |
| M15 | L | W100 | 1 | X2:3 |
| | N | | 2 | X2:4 |
| | PE | | G/G | PE |
| Reduced speed / Stop unit | | W380 | 1 | X3:10 |
| | | | 2 | X3:11 |
| Normal speed / Start unit | | W381 | 1 | X3:12 |
| | | | 2 | X3:13 |
| Ext. Fire signal | | | | X3:13 |
| | | | | X3:15 |
| R4 | | W311 | 1 | X3:20 |
| | | | 2 | X3:21 |
| R9 | | W363 | 1 | X3:22 |
| | | | 2 | X3:23 |
| R5 | | W314 | 1 | X3:23 |
| | | | 2 | X3:24 |
| P4 | 24V | W340 | 1 | X3:25 |
| | 0-10V | | 2 | X3:26 |
| | ANG | | 3 | X3:27 |
| P8 | 24V | W354 | 1 | X3:29 |
| | 0-10V | | 2 | X3:30 |
| | ANG | | 3 | X3:31 |
| P3 | 24V | W341 | 1 | X3:32 |
| | 0-10V | | 2 | X3:30 |
| | ANG | | 3 | X3:31 |

| Product Description | Product Terminal | Cable | Wire | Switchboard Terminal |
|------------------------|------------------|-------|------|----------------------|
| M6 | ANG | W320 | 1 | X3:42 |
| | 24V | | 2 | X3:43 |
| | 0-10V | | 3 | X3:41 |
| M7 | ANG | W321 | 1 | X3:42 |
| | 24V | | 2 | X3:43 |
| | 0-10V | | 3 | X3:44 |
| Repeater | EO-R 1G | W90 | 1 | X3:45 |
| | EO-R 2GO | | 2 | X3:46 |
| Heating active | "NO" | | | X3:48 |
| | | | | X3:49 |
| Alarm signal | "NO" | | | K4:11 |
| | | | | K4:14 |
| Operating signal | "NO" | | | K8:21 |
| | | | | K8:24 |
| Changeover signal | "NO" | | | X5:11 |
| | | | | X5:12 |
| Rec. Signal | "NO" | | | X5:13 |
| | | | | X5:14 |
| | | | | X5:14 |
| P9 | 24V | W353 | 1 | X5:14 |
| | 0-10V | | 2 | X5:16 |
| | ANG | | 3 | X5:15 |
| R7 | | W360 | 1 | X5:21 |
| | | | 2 | X5:22 |
| R8 | | W361 | 1 | X5:23 |
| | | | 2 | X5:24 |
| Circulation pump start | | | | X5:32 |
| | | | | X5:34 |

d.3 Hand terminal (optional for DV units – always standard for TIME units)

The hand terminal is delivered in a cardboard box containing the other external components. This cardboard box is usually, but not always, placed in the section with the supply air fan. The Operator's Guide for the hand terminal is the annex 17 attached to this – User Manual.









1. ALARM: Press for alarm list
2. Alarm LED – red light for alarm
3. LED indicating change of parameters
4. OK/ENTER
5. Press for clear
6. Press for move of curser in menu

Important! All LEDs on the hand terminal must be off before startup of the unit.







d.4 Dimensions of the units – selected examples.

Examples on dimensions of selected configurations below. Other configurations have other dimensions.

Extract air ◀ Supply air ▶

| Rotary Heat Exchanger | | Unit size | | | | | | | | | | | | | |
|--|-----------|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 80 | 100 | 120 | 150 | 190 | 240 |
| Standard | Width | 970 | 1120 | 1270 | 1420 | 1570 | 1720 | 2020 | 2170 | 2170 | 2370 | 2590 | 2890 | 3190 | 3490 |
| Rotary Heat Exchanger | Width | - | - | - | - | - | - | - | - | 2320 | 2520 | 2890 | 3040 | 3720 | 4020 |
| Single height unit | Height* | 520 | 595 | 670 | 745 | 820 | 895 | 1045 | 1120 | 1270 | 1420 | 1570 | 1720 | 2170 | 2470 |
| Double height unit | Height* | 970 | 1120 | 1270 | 1420 | 1570 | 1720 | 2020 | 2240 | 2540 | 2840 | 3140 | 3440 | 4340 | 4940 |
| C1E  | Length | 2160 | 2160 | 2460 | 2460 | 2760 | 3060 | 2910 | 3280 | 3210 | 3960 | 4260 | 4560 | 5010 | 5530 |
| | Weight kg | 430 | 520 | 660 | 760 | 920 | 1100 | 1470 | 1980 | 2140 | 2630 | 3250 | 3990 | 6290 | 7610 |
| C2E  | Length | 2910 | 2910 | 3210 | 3210 | 3510 | 3810 | 3660 | 4030 | 4030 | 4930 | 5230 | 5530 | 5980 | 6430 |
| | Weight kg | 500 | 610 | 770 | 870 | 1080 | 1270 | 1690 | 2250 | 2470 | 3050 | 3890 | 4690 | 7220 | 8600 |
| C3E  | Length | 2680 | 2680 | 3130 | 3130 | 3430 | 3880 | 4030 | 4400 | 4400 | 5450 | 5900 | 6200 | 6430 | 7100 |
| | Weight kg | 480 | 580 | 730 | 810 | 1010 | 1220 | 1700 | 2230 | 2480 | 3160 | 3870 | 4660 | 6870 | 8280 |
| C4E  | Length | 3430 | 3430 | 3880 | 3880 | 4180 | 4630 | 4780 | 5220 | 5220 | 6420 | 7020 | 7170 | 7400 | 8000 |
| | Weight kg | 560 | 660 | 840 | 930 | 1180 | 1390 | 1930 | 2560 | 2830 | 3610 | 4560 | 5320 | 7790 | 9180 |
| C5E  | Length | 2680 | 2680 | 3130 | 3130 | 3430 | 3880 | 3730 | 4100 | 4100 | 5080 | 5380 | 5680 | 6430 | 7100 |
| | Weight kg | 480 | 570 | 720 | 800 | 1010 | 1220 | 1630 | 2120 | 2330 | 2970 | 3620 | 4390 | 6860 | 8280 |
| C6E  | Length | 3430 | 3430 | 3880 | 3880 | 4180 | 4630 | 4480 | 4850 | 4850 | 6050 | 6350 | 6650 | 7400 | 8000 |
| | Weight kg | 550 | 660 | 840 | 920 | 1180 | 1380 | 1850 | 2410 | 2670 | 3370 | 4280 | 5060 | 7790 | 9170 |

Extract air ◀ Supply air ▶

| Plate Heat Exchanger | | Unit size | | | | | | | | | | | | | |
|---|-----------|-----------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|
| | | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 80 | 100 | 120 | 150 | 190 | 240 |
| | Width | 970 | 1120 | 1270 | 1420 | 1570 | 1720 | 2020 | 2170 | 2170 | 2370 | 2590 | 2890 | - | - |
| Single height unit | Height* | 520 | 595 | 670 | 745 | 820 | 895 | 1045 | 1120 | 1270 | 1420 | 1570 | 1720 | - | - |
| Double height unit | Height* | 970 | 1120 | 1270 | 1420 | 1570 | 1720 | 2020 | 2240 | 2540 | 2840 | 3140 | 3440 | - | - |
| Q1E  | Length | 3210 | 3580 | 4030 | 4330 | 4780 | 5080 | 5230 | 5460 | 5230 | 5910 | 6960 | 7260 | - | - |
| | Weight kg | 570 | 760 | 940 | 1130 | 1370 | 1640 | 2300 | 2550 | 2610 | 3210 | 4200 | 5130 | - | - |
| Q2E  | Length | 3960 | 4330 | 4780 | 5080 | 5530 | 5830 | 5980 | 6210 | 5980 | 6880 | 7930 | 8230 | - | - |
| | Weight kg | 660 | 850 | 1060 | 1260 | 1540 | 1810 | 2520 | 2880 | 2910 | 3660 | 4870 | 5790 | - | - |
| Q3E  | Length | 3800 | 4100 | 4700 | 5000 | 5450 | 5900 | 6050 | 6280 | 6280 | 7330 | 8380 | 8680 | - | - |
| | Weight kg | 650 | 820 | 1030 | 1140 | 1470 | 1760 | 2480 | 2720 | 2840 | 3620 | 4600 | 5550 | - | - |
| Q4E  | Length | 4550 | 4850 | 5450 | 5750 | 6200 | 6650 | 6800 | 7030 | 6800 | 8000 | 9050 | 9350 | - | - |
| | Weight kg | 720 | 900 | 1140 | 1310 | 1630 | 1930 | 2720 | 3030 | 3130 | 3980 | 5150 | 6130 | - | - |
| Q5E  | Length | 3800 | 4100 | 4700 | 5000 | 5450 | 5900 | 6050 | 6280 | 6130 | 7030 | 8080 | 8680 | - | - |
| | Weight kg | 640 | 810 | 1020 | 1170 | 1480 | 1750 | 2460 | 2700 | 2890 | 3690 | 4690 | 5840 | - | - |
| Q6E  | Length | 4550 | 4850 | 5450 | 5750 | 6200 | 6650 | 6800 | 7100 | 6800 | 8000 | 9050 | 9350 | - | - |
| | Weight kg | 720 | 900 | 1140 | 1300 | 1620 | 1920 | 2700 | 3030 | 3200 | 4120 | 5320 | 6380 | - | - |

* DV 10-150 : Height excl. base frame DVZ. DV 190-240 : Height incl. base frame.

d.5 Ordinary automatically operation – only manual operation by new parameters.

The unit is operating fully automatically and manual operation includes only selection of new parameters via the buttons on the hand terminal. The hand terminal is connected by a cable to the controller in the cabinet. 10 meters of cable is delivered with the unit and the customer has the possibility to replace this cable with an identical type of cable that is up to 100 meters long. The alternative is that the controller is connected to a BMS system with the ability to select new parameters via PC, tablet, SmartPhone or mobile phone.

d.6 Warnings about dangers

Pictograms are according to EN1886 about;



Warning about danger by rotating parts



Warning about danger by electricity



Warning about danger by heat



Disregards of instructions shown on warning signs are connected by risk for injury or damage on material.

e. Drawings, diagrams, guides and instructions for the use, maintenance and repair

All DV units with integrated control system and TIME units are manufactured in compliance with the EC Declaration of Conformity and they are CE marked as machines. Unique Declaration with production number of the machine is an integral part of the machine – enclosed as annex 1 to this manual. If the buyer carries out changes or adds components in or on the machine, the buyer must issue a new EC Declaration of Conformity and a new CE marking of the machine. To promote correct use of the machines, the below-mentioned instructions are an integral part of the machine:

- Unique drawings, data and description of functions for the delivered unit – annex 2
- Wiring diagrams – annex 16
- Operator's Guide – annex 17

- Instructions for use of the machine – section k in this manual
- Instructions about adjustment and maintenance – section r in this manual
- Safety during adjustment and maintenance – section s

f. Employees in charge of operation/control/maintenance

The unit is able to operate fully automatically when the installer has started, adjusted and handed over the faultless unit to the staff that takes care of operation, control and maintenance.

f1. Employees that take care of ordinary operation

Indications of operation status as well as indication of faults are visible in the display and on the LED's of the hand terminal. The employees can enter new parameters in the controller via the buttons on the hand terminal. The alternative is that the controller is connected to a BMS system with the ability to select new parameters via PC, tablet, SmartPhone or mobile phone.

g. Intended use and range of applications

The air handling units are intended for the transport and treatment of air between -40 °C and + 40 °C. The units are exclusively for comfort ventilation and not for air that causes severe corrosion to galvanized steel and to copper and aluminum. The units are not for environments that exceed the corrosion class C4 according to EN ISO 12944-2.

Intended applications for the units are:

Offices, teaching rooms, hotels, shops, homes and similar comfort zones.

h. Unintended use and misuse – inappropriate applications for the machine

The air handling units are not suitable for transport of air with risk of explosion and with Ex-Classification. Do not install the units in Ex-areas at all.

Do not install units outdoors unless the units are constructed for outdoor installation. Units not suitable for outdoor installation are units without roof and units with cabinet installed on the unit (the cabinet is installed inside the unit for outdoor installation).

The units are not for environments that exceed the corrosion class C4 according to EN ISO 12944-2, and the units are not for transport of solid particles.

Not intended applications for the units are:

Kitchen extraction, swimming pools, off-shore, Ex-areas, drying of washed clothes.

Do not use the unit with partly finished duct systems. Do not use the unit for ventilation of the building site until the unit is properly provided with guards.

h.1 Air handling unit in operation

The pressure difference between interior and exterior of the unit must not exceed 2000 Pa for the DV 10 and up to DV 150 (including DV 150), and 1500 Pa for DV 190 and DV 240.

Before start-up of the unit all ducts, guards and all protective devices must be mounted to prevent any access to rotating fan impellers. All inspection doors must be closed and locked when the unit is in operation.

Do not use the unit without filters.

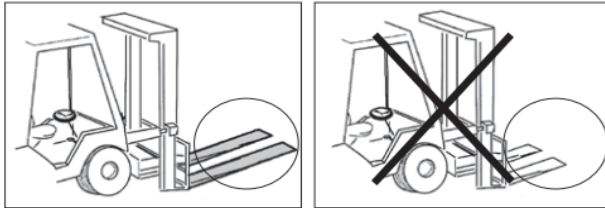
i. Instructions for unloading on the site as well as installation and connection

i.1. Unloading on the site

The air handling unit – AHU - is delivered as one section or in several sections, which are to be assembled on site. The AHU is delivered on transport pallets, legs or on a base frame. Loading and unloading as well as transport on the site is possible by fork-lift truck or by crane using suitable lifting straps.

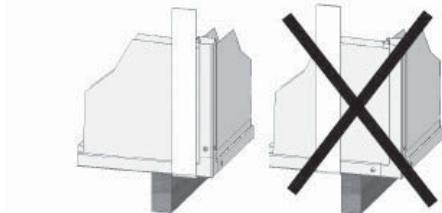
i.1.1 Unloading by fork-lift truck

The forks of the truck must be sufficiently long to avoid any damage to the AHU underside.

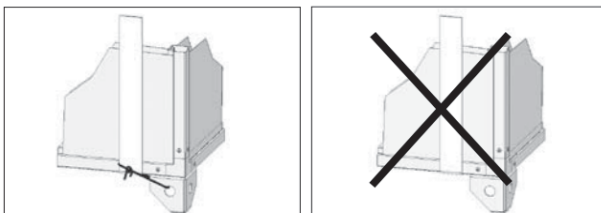


i.1.2 Unloading by crane

AHU delivered on transport pallet must be lifted by straps as shown in the illustration.



AHU delivered with legs must be lifted by straps secured to the legs as shown in the illustration.



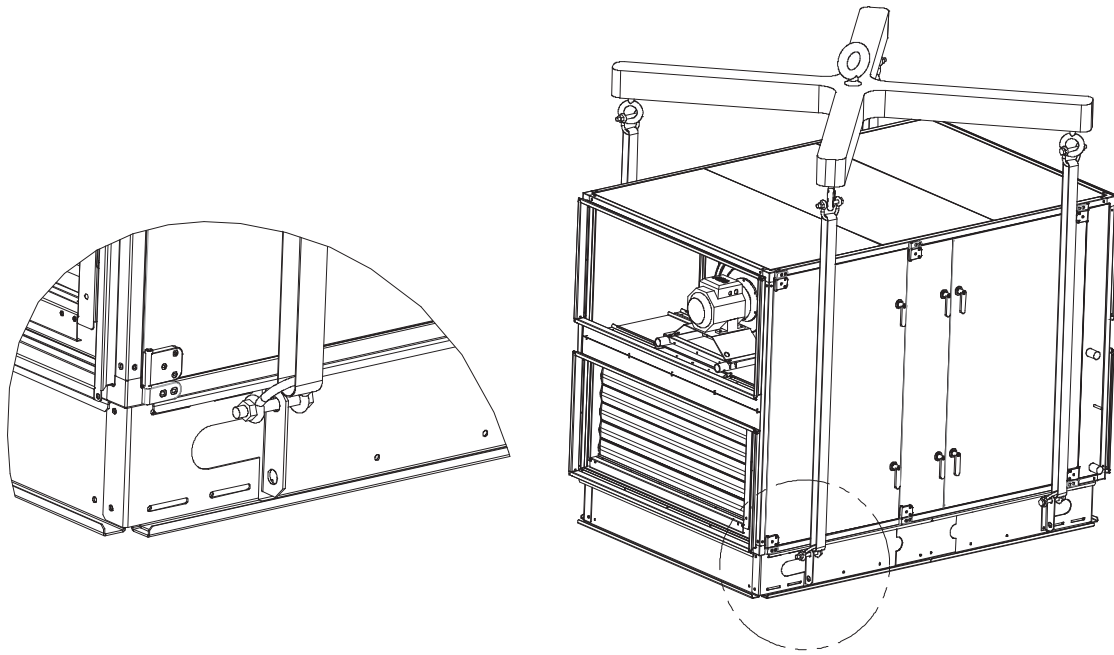
i.1.3 Transport of unit without base frame on the site

Units without base frame are always delivered in sections with each section on a pallet. Sections can be transported on the site by hand manual forklifts.

i.1.4 Lifting a unit with straps

Use an appropriate lifting beam with a sufficient span to avoid that the straps touch and damage the drip nose profiles and the inspection side with handles, pipes and accessories – for example manometers, cabinets, tabs for measuring the pressure.

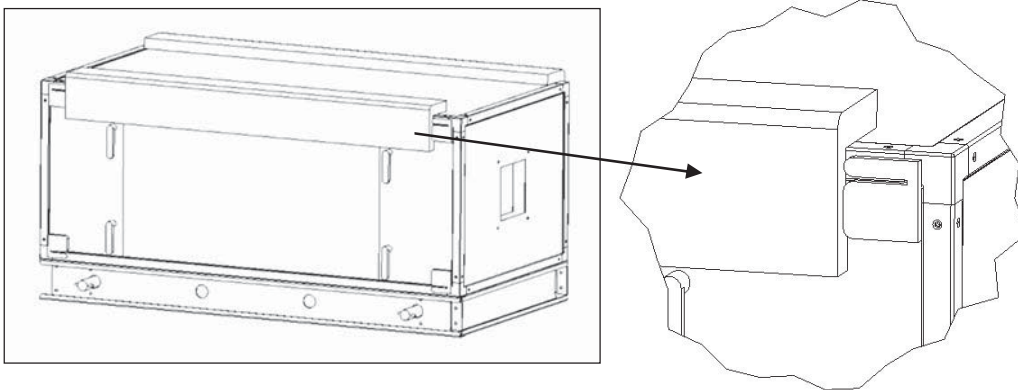
i.1.5 Lifting a unit with preinstalled brackets on the base frame for lifting.



Lifting beam and straps are not included in the delivery.

i.1.6 Roof unit with bitumen roof

Avoid damaging the drip nose profiles along the bitumen roof. Keep the protection profiles of Styrofoam on the unit until the installation has been completed. If the unit is lifted by straps, the straps must be kept away from the drip nose profiles by bars to avoid damage to roofing profiles.



i.1.7 Roof unit with steel roof

For units with steel plate roof, the steel plates are delivered uninstalled on a separate pallet. Do **not** step or walk on the plates.



i.1.8 Pre-assembly storage

The AHU must be protected from the weather and accidental impact. Plastic packaging **must** be removed and the unit covered with tarpaulin or similar materials. In order to minimize condensation, sufficient air circulation must be ensured between the covering and the unit.

i.1.9 Tilt less than 30° during transportation of the section with cooling compressor – DVU or DVU-C

During transportation, the unit section - DVU or DVU-C- **must** always be in the upright position or tilted less than 30°. If it is necessary to tilt the unit more than 30°, the suction pipe of the compressor must point upwards to prevent the escape of oil from the compressor sump.

i.2. Installation - mechanical

i.2.1 Free area in front of and above the unit

Important! When positioning the unit on the site, it must be ensured that an area with the same width as the unit is kept free for service and inspection and also for replacement of fans and exchanger, if needed. The width of the free area must be at least 900 mm.

Important! For safe access to the cabinet with electrical components, if the cabinet is placed on top of the unit, the free area from the upper edge of the cabinet to the ceiling must be at least 700 mm.

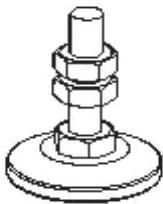
i.2.2 Supporting surface

The surface beneath the unit must be level, horizontal and vibration-free. The surface must be able to withstand the load of the AHU. Weights of the sections are written in Annex 2.

Remember! Duct work must be sound insulated and must not be mounted directly on beams, trusses or other critical building parts.

i.2.3 Adjustable feet under legs or base frame and transport of sections

Adjustable feet are provided in a carton box placed inside the unit. Adjustable feet are delivered for indoor units and not for outdoor units.



Sections can be transported on the site by hand manual forklifts or similar. The frame profiles in the edges of the sections have carrying capacity for lifting by the hand manual forklifts.

i.2.4 Base frame assembly

The base frame is delivered unassembled and has to be assembled on the site before it is possible to position and assemble the various sections of the AHU. Assembly of the base frame is illustrated on 4 pages in a manual that is always in a plastic folder and is attached to one of the large base frame parts. This manual is available on the site among the base frame parts.

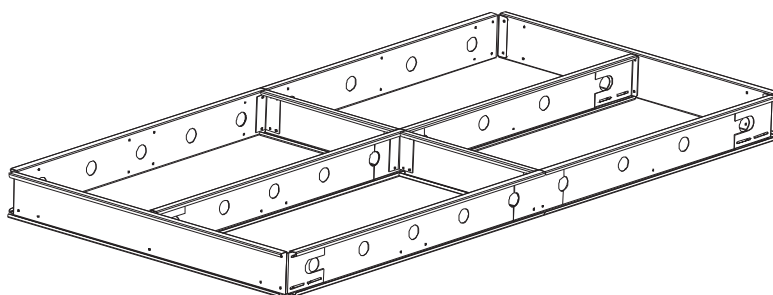
There are two types of base frames:

1. 150 mm high base frames
2. 250 mm high base frames

There are 4 different manuals and each of them illustrates the assembly of the 4 different types of base frames:

1. Manual about the 150 mm high base frames for AHUs in the sizes from DV 10 to DV 40. The name of this manual is – **Base frame 150 DVZ 10 - 40**
2. Manual about the 150 mm high base frames for AHUs in the sizes from DV 50 to DV 150. The name of the manual is – **Base frame 150 DVZ 50 - 150**
3. Manual about the 250 mm high base frames for AHUs in the sizes from DV 10 to DV 40. The name of the manual is – **Base frame 250 DVZ 10 - 40**
4. Manual about the 250 mm high base frames for AHUs in the sizes from DV 50 to DV 150. The name of the manual is – **Base frame 250 DVZ 50 - 150**

Example of 150 mm high base frame for AHUs in the size from DV 50 to DV 150



Mount adjustable feet with a distance of maximum 1500 mm between each foot under the base frame. The base frame can now be levelled by the adjustable feet. The next step is to place and assemble AHU sections on the base frame.

i.2.5 Base frames for outdoor units

Outdoor units must be installed on 250 mm high base frames and are always fitted to the AHU sections. Hot-dip galvanized base frames are recommended for outdoor units. Systemair delivers these base frames without the above mentioned adjustable feet.

i.2.6 Installation on the site of unit sections at the base frame when sections are delivered on pallets.

Lift up the section by hand manual forklifts to the level where the underside of the section is even with the overside of the base frame.

1. Pull the section to the correct position on the base frame by lifting straps – it is maybe necessary to support the section by heavy duty furniture trolleys (see the photos below)

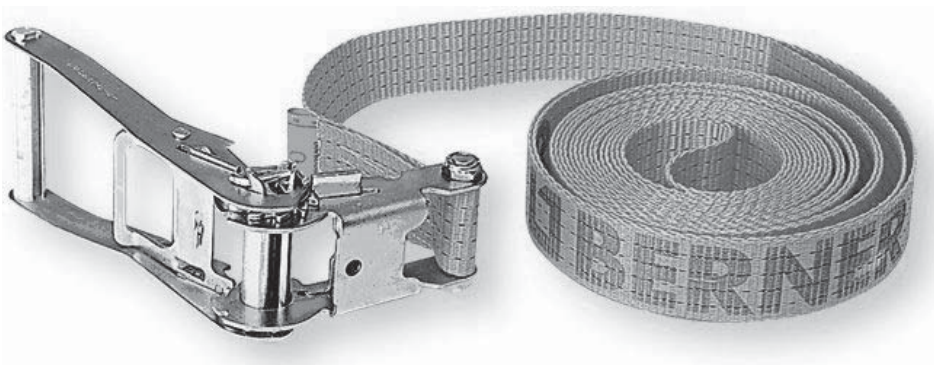
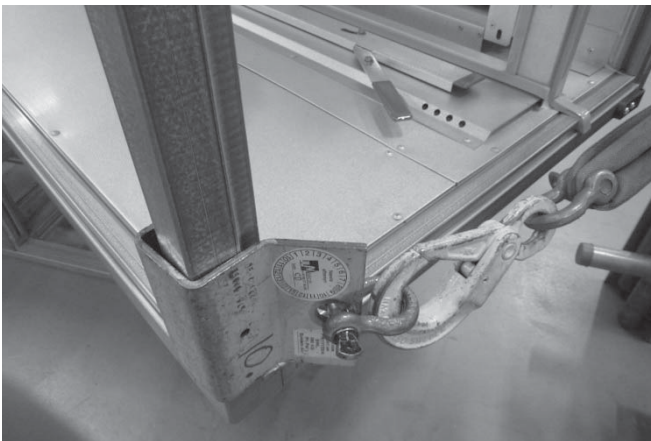


Example of heavy duty furniture trolley turned with the wheels upwards. Placed in this way on the forks of the hand manual forklifts the heavy duty furniture trolleys are suitable for safe and careful rolling of the unit sections over to the base frames.

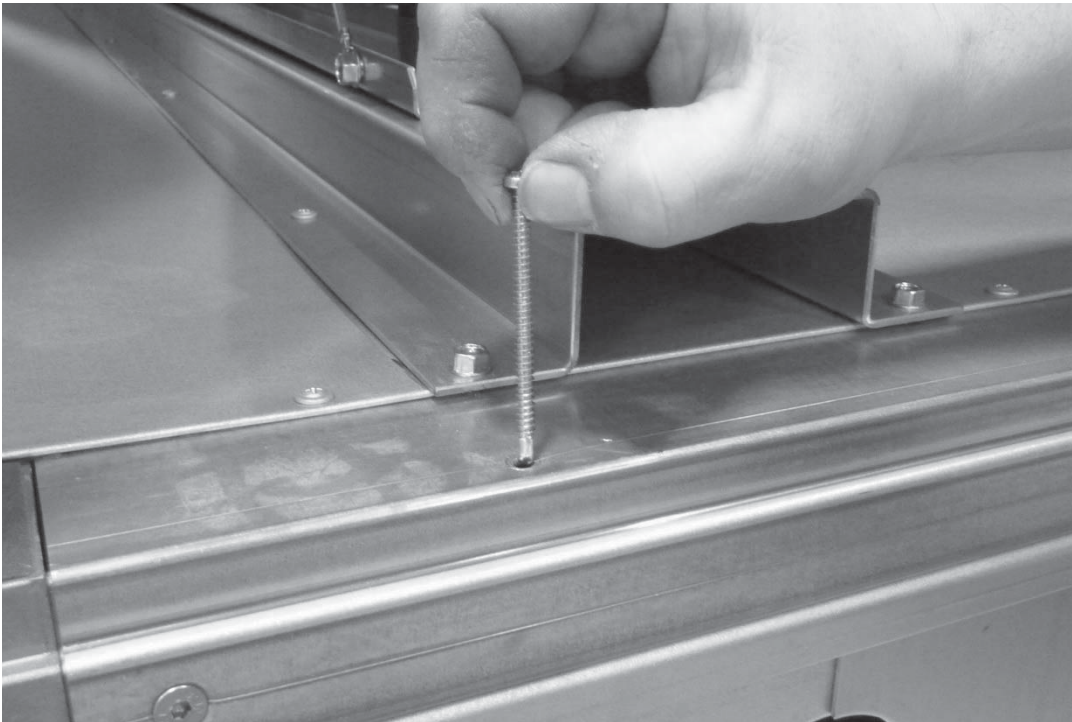


Example of very heavy duty furniture trolleys. Turned with the wheels upwards and placed on the forks of hand manual forklifts these heavy duty furniture trolleys are very suitable for safe and careful rolling of the unit sections over to the base frames.

2. Pull sections together with lifting straps. We recommend the below shown type of brackets because this type is not damaging the frame profiles of the units. An example of lifting straps is shown below.



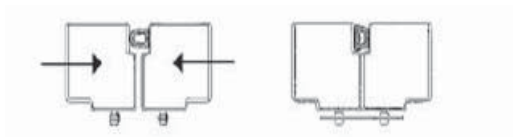
3. Sections are mounted to base frames with long self-drilling screws. The frame profile under the inspection doors is placed over the horizontal profile of the base frame. See the example on the photo below.



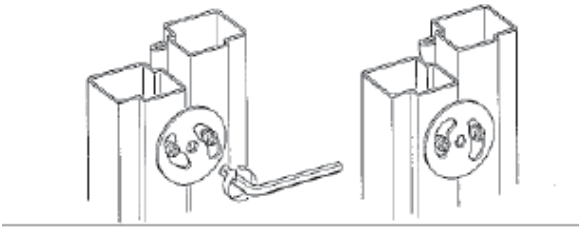
i.2.7 Joining the AHU sections

The sections must be placed on the base frame and if the unit is delivered with 100 mm legs, the sections must be positioned directly opposite each other.

1. Ensure that the internal factory-fitted rubber sealing is undamaged
2. The sections are then to be positioned directly opposite each other. If the sections are built with legs, the adjustable feet can be used to get the sections parallel and at the same height.
3. Press the sections hard together so that the rubber profiles are so flat that the iron frames of the two sections are joined. Straps with tensioner as shown below are suitable for pressing the sections hard together.



4. The sections are then to be locked permanently together with the black plastic-coated Systemair Disc-Locks. The Disc-Locks are delivered in a carton box placed inside the unit. Place each Disc-Lock over the 2 factory fitted locking pins. The discs and locking pins are not reliable for pulling the sections together. They are only sufficient for keeping the sections well together, so just turn each disc gently with the supplied Allen key. Use a sequence where each disc is tightened with only one click at a time. If the unit is placed too close to a wall with no space left for the mounting of Systemair Disc-Locks, brackets must be placed inside the unit to keep the sections permanently together (brackets for this purpose are not delivered by Systemair)



i.2.8 Fitting the ductwork

Flexible duct connections between AHU and ductwork must always be installed. Be sure that flexible duct connections are almost fully stretched. (Flexible connections are ordered as accessories and they are placed inside the unit). At the fan outlet on a centrifugal fan, the duct size should be as close to the outlet size as possible. Avoid blockage and turbulence at the fan outlet.

i.2.9 Risk of stack effect by vertical ducts and wind pressure on louvers

On special occasions stack effect – also called chimney effect – in the ducts create airflows that drives the impellers by turned off motors.

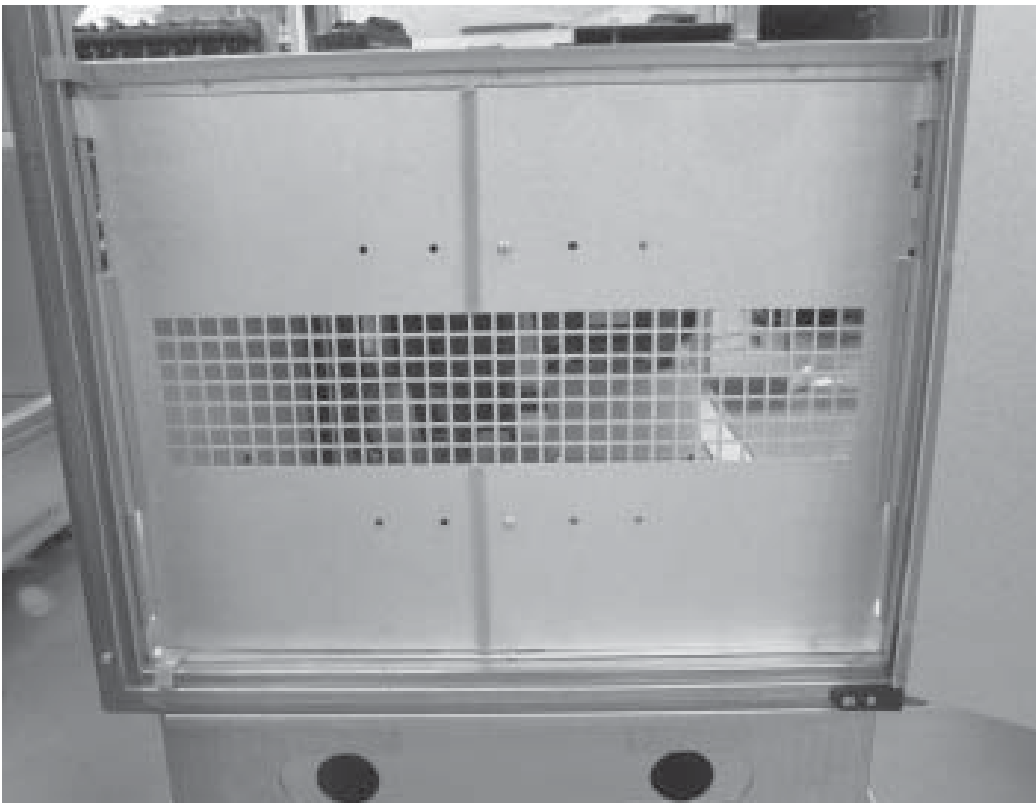
A rotating impeller is a potential hazard during cleaning and maintenance of the unit.

Eliminate this airflow by dampers with spring return motors for automatic closing of the dampers - even by power failure.

Important! The Systemair air handling units can be ordered and delivered without dampers, and the installer/user must check that duct systems with the described risk of stack effect (chimney effect) will be provided with dampers and spring return motors.

i.2.10 Refitting of guards

The guard is a safety guard installed inside the door. Tools are necessary for the removal of the guard. If the guard has been demounted during the installation on the site, the guard must be refitted before startup of the unit.



Insert the edges of the guard in the frame profile in the groove that is in the frame profile, and connect both parts of the guard at the middle with 2 screws.
Replace the vibration damping foam rubber list if it is damaged.

i.3. Installation - electrical

i.3.1 Description

The position of components is shown and described in annex 2.

Connections to terminals are shown in the wiring diagram – annex 16.

When control of constant pressure in the ducts (also called demand controlled capacity) is required, the pressure transmitters must measure in the duct system at places where all pressure changes can be registered accurately for reliable pressure control. This placement is left to the customer's free choice. It is important to achieve a constant pressure – also for the most faraway diffusers.

i.3.2 Wiring diagrams

The wiring diagrams are printed in separate manuals delivered with the units as annex 16.

The wiring diagrams are not unique for the order specific units, but it is standard wiring diagrams with data about all configurations of the units. Hereby the wiring diagrams will inform about components that are not ordered and delivered. See the order confirmation and annex 2 with exact information about the accessory components that are ordered and delivered.

The wiring diagram includes:

General description, Circuit diagrams, Cabinet layout, Terminal matrix and Cable plan.

The wiring diagrams are on the DVD delivered with every unit.

i.3.2.1 TIME units - labels on the cabinet next to the supply fan

- Label with data about the cabinet – including data about fuses – see section d.2.2
- Flowchart – see section d.2.3 – standard and not unique for the order specific unit
- Label with terminal plan for external components – see section d.2.5 – standard, and not unique for the order specific unit

i.3.2.2 DV units – labels on or with the cabinet

- Label with data about the cabinet – including data about fuses – see section d.2.2
- Flowchart – see section d.2.3 – unique for the order specific unit – printed with the unique production number of the unit
- Label with terminal plan for external components – see section d.2.5 – standard, and not unique for the order specific unit

i.3.3 Installation of mains power supply

An AC/DC residual current device must be installed in the power supply. The power supply for the units is 3*400 V + N + PE - 50 Hz. Protection of the units in accordance with the local statutory requirements for the additional protection of systems with frequency converters.

i.3.3.1 Necessary mains power supply for TIME units with ec motors and without DVU

Necessary mains power supply in the table below and in the wiring diagram in annex 16. This information is also printed on the unique machine card placed on the front of every unit (see example of a machine card in section d.2.1).

| Unit | Motor | Fuse Minimum | Fuse Maximum | Maximum Short-circuit current |
|---------|------------------------|-----------------|-----------------|----------------------------------|
| TIME 10 | 2*0.94 kW 2*0.99 kW | 10A | 16A | 16kA |
| TIME 15 | 2*0.99 kW 2*1.7 kW | 10A 13A | 25A | 16kA |
| TIME 20 | 2*1.7 kW 2*3.0 kW | 13A | 25A | 16kA |
| TIME 25 | 2*3.0 kW 2*2.73 kW | 13A 13A | 25A | 16kA |
| TIME 30 | 2*2.73 kW 2*5.18 kW | 20A | 32A | 16kA |
| TIME 40 | 2*5.18 kW 2*4.7 kW | 20A 20A | 32A | 16kA |

i.3.3.2 Necessary mains power supply for DV units with cabinet/control system

Necessary mains power supply is printed on the unique machine card placed on the front of every unit (see example of a machine card in section d.2.1).

i.3.3.3 Necessary overvoltage protection device, that leads lightning overvoltage to an earth lead on a safe way.

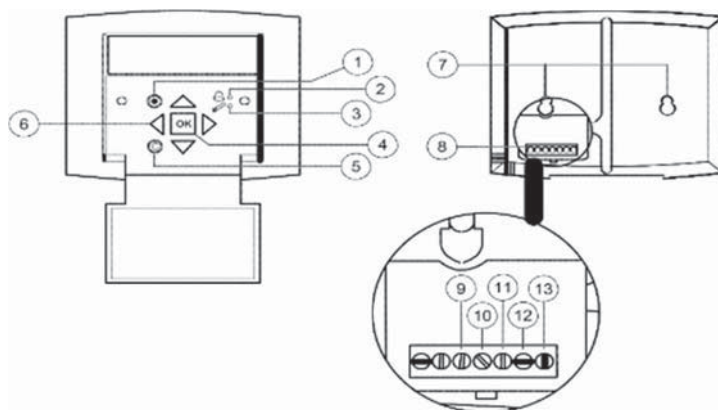
The Installer and user must be aware of the fact that lightning strikes make a risk that requires installation of overvoltage protection devices to lead the lightning overvoltage to an earth lead in a safe way. Installer and user must take care of this according to local statutory requirements.

i.3.4 Electrical connection of components and functions

External components and functions are delivered according to the order confirmation. Cable number's are written on the cables, on the label with terminal plan on or with the cabinet – see section d.2.5 and in the wiring diagrams – annex 16.

i.3.4.1 Connection of the Systemair Control Panel to the Corrigo E28 controller – software version 3.3

The SCP panel – part number S-208997 for software version 3.3 - is provided with 10 metres of cable and a socket for connection with the controller inside the cabinet. The cable is not pulled through the cable entry in the cabinet, so demount the cable at the back of the Systemair Control Panel - pull the cable through the cable entry in the cabinet - adjust the length of the cable and remount the cable in the panel, or add more cable – up to 100 m of cable between the Systemair Control Panel and the controller is possible. Place the Systemair Control Panel on the outer side of the unit or on a wall.



| Position | Description |
|----------|--|
| 1 | Alarm button: Press for alarm list. |
| 2 | Alarm indicator: Flashing for unacknowledged alarm. |
| 3 | Write enable LED: Slow flashing indicates parameters can be changed. |
| 4 | OK button: Press to activate a selected menu/setting, if possible. |
| 5 | Button for clear: Abort a parameter setting or – if possible - restore the original value. |
| 6 | Right/left – and up/down buttons: Used for navigation up and down and to the right and left in the menu tree. Up/down buttons are also used for increasing or decreasing values of parameters. |
| 7 | Holes for mounting |
| 8 | Terminal block |
| 9 | No cable on terminal 5 for software version 3.3 (illustrated with number 9 on the above drawing) |
| 10 | Brown cable on terminal 4 for software version 3.3 (illustrated with number 10 on the above drawing) |
| 11 | Yellow cable on terminal 3 for software version 3.3 (illustrated with number 11 on the above drawing) |
| 12 | White cable on terminal 2 for software version 3.3 (illustrated with number 12 on the above drawing) |
| 13 | Black cable on terminal 1 for software version 3.3 (illustrated with number 13 on the above drawing) |

i.4 Installation – Pipes for water – hot and chilled, valves and drains

i.4.1 Description

If ordered with the unit, the valves and valve motors are stored in a carton box placed inside the unit. Water trap(s) – standard or optional - is (are) necessary to ensure escape of water from the tray under plate heat exchanger and (or) cooling coil. Water trap(s) is (are) stored in a carton box placed inside the unit.

i.4.2 Pipe connections

Connection pipes on heating- and cooling coils are provided with external thread. Drainage outlets on drip trays are provided with external thread.

i.4.3 Possibility of extracting components from the unit

Pipes and cables must not obstruct the inspection doors and components which can be extracted from the unit. Potential components for extraction are filters, fans and rotary heat exchanger.

i.4.4 Pipe connections to batteries

i.4.4.1 Heating coils

Pipes for hot water must be protected by insulation against frost and loss of heat. Further protection against frost can be obtained by installing electrical heating wires around the pipes and under the insulation combined with temperature sensors and a control system. Pipes, insulation, electrical heating wires, control system for heating wires and circulation pump are not delivered by Systemair.

i.4.4.2 Cooling coils

If ordered with the unit, the valves and valve motors are stored in a carton box placed inside the unit. Pipes for cooling must be protected by insulation against condensation on the pipes and loss of cooling in the summer. Pipes and insulation are not delivered by Systemair.

i.4.4.3 Rigid pipe mounting brackets for valves, circulation pumps and pipe system

The coil and pipes from the coil are not constructed to withstand the weight and stress from valves, circulation pumps, long pipes and insulation of pipes. The system must be supported carefully in rigid pipe mounting brackets to roof, floor and walls.

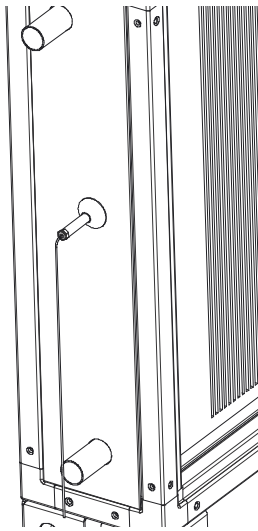
i.4.4.3.1 Pipe connection to heating coils

The heating capacity of the coil with only 2 rows is independent of the connection of the hot water in equal flow or in counter flow to the direction of the air, but connection of the hot water to the pipe marked for inlet and the return water to the pipe marked for outlet is very important to ensure that the sensor for transmission of the water temperature really will be placed in a return circuit of the coil (Screw-joint for the water temperature sensor is welded in the main collection pipe for return water).

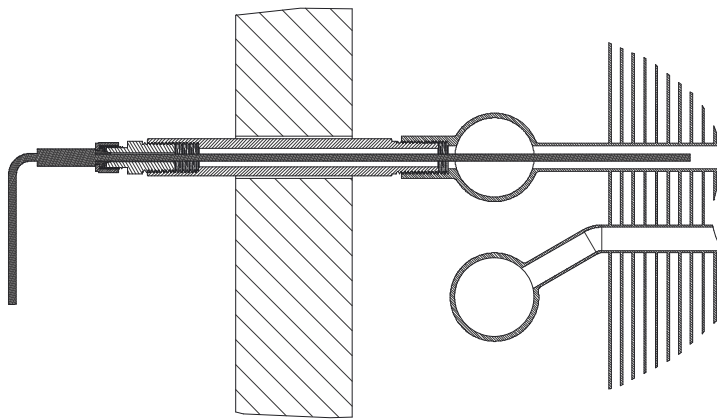
For the frost protection of heating coil, the water temperature in the coil is transmitted to the controller. The controller always generates a signal to the valve motor that keeps a sufficient flow of hot water to protect the coil against frost. This frost protection is also activated when the running mode is "off". Coils with 3 rows or more must always be connected in counter flow to the airflow.

NOTE: If glycol is added, the glycol must be without additives and auto glycol must not be used. Automatic bleeding has to be installed at the highest point of the 2 pipes — supply or return pipe.

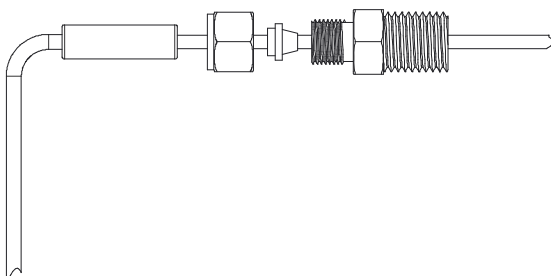
If the heating battery is built with 3 or more rows, the water flow must be in counter flow to the direction of the air.



To protect against frost a temperature sensor for the transmission of an analog signal to the controller is placed in a pipe on the collection pipe for return water. The sensor must be fitted water tight with a cap in the pipe before water under pressure is in the battery. The pipe for the sensor is soldered on the collection pipe and it is important to hold contra on the pipe, when the cap is tightened.



Battery seen from above. The sensor measures the water temperature of the water inside one of the small pipes for return water in the battery. The sensor reduces the area in this pipe and hereby also the flow of warm water in this pipe. The temperature in this pipe is reduced more than the temperature in all other pipes by the airflow through the battery. Because the lowest temperature in the battery probably is measured here, this system creates early and safe warning of frost.



It is important that the cap is tightened sufficient to keep the sensor system fully water tight.

i.4.4.3.2 Pipe connection to cooling coils for chilled water

Coils with 3 rows or more must always be connected in counter flow to the airflow.

NOTE: The glycol must be without additives and auto glycol must not be used.

Automatic bleeding has to be installed at the highest point of the 2 pipes — supply or return pipe.

i.4.4.3.3 Valve motor and valve for heating

The valve and valve motor are not installed. 2-way or 3-way valve is available.

i.4.4.3.4 Valve motor and valve for cooling

The valve and valve motor are not installed. 2-way or 3-way valve is available.

i.4.5 Draining condensate water

Drip trays for collection of condensate water are installed under plate heat exchanger and cooling coil. Each drip tray is provided with a drainage outlet. A water trap is always necessary. To avoid freeze ups and frost bursts of water trap and pipes, sufficient insulation is recommended and installation of heating between the insulation and water trap/pipes could even be necessary (insulation, heating and controller for the heating are not delivered by Systemair).

i.4.6 Draining condensate water from plate heat exchanger

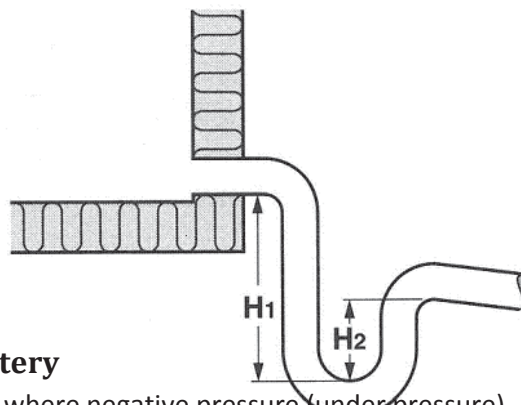
Heavy negative pressure where the condensate from the plate heat exchanger is collected in the drip tray allows air to flow through the drainage pipe into the unit and prevents condensate water from flowing out of the unit through the drainage pipe. A water trap with sufficient closing level of the water is extremely necessary to ensure that condensate water flows out of the unit. The pipe diameter of the water trap and sewage system must be identical to the pipe diameter of the drainage outlet from the tray.

The closing level of the water trap must be estimated correctly to ensure safe escape of the water (see the illustration and estimate the minimum closing level according to the table).

A water trap is optional and installation of the water trap is not included.

Negative pressure P (Pa)

| P | H1 Minimum | H2 |
|----------|------------|-------|
| 500 Pa | 100 mm | 40 mm |
| 750 Pa | 150 mm | 55 mm |
| 1.000 Pa | 190 mm | 70 mm |



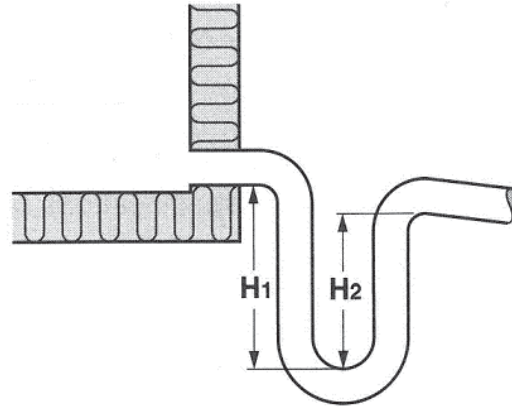
i.4.7 Draining condensate water from cooling battery

If the cooling battery and the drip tray are placed in the unit where negative pressure (under pressure) occurs, the closing level of the water trap must be estimated correctly. See the above-mentioned information in section i.4.6 – Draining condensate water from the plate heat exchanger.

If the cooling battery and the drip tray are placed in the unit where positive pressure (over pressure) occurs, the closing level of the water trap must be estimated correctly as shown on the illustration. A water trap is optional and installation of the water trap is not included.

Positive pressure P (Pa)

| P | H1 Minimum | H2 |
|----------|------------|--------|
| 500 Pa | 90 mm | 65 mm |
| 750 Pa | 120 mm | 90 mm |
| 1.000 Pa | 150 mm | 120 mm |



j. Installation and assembly instructions for reduction of noise and vibration emissions

Due to the design and construction of the units the (A) weighed sound pressure level from fans and other components do not exceed 70 dB (A) outside the units.

Data about sound in annex 2.

Installation of the units on springs will reduce the transmission of noise and vibrations to the building.

Systemair does not deliver springs for this purpose.

Flexible connections between the units and the ducts are available as accessories.

k. Instructions for putting into service, adjustments, use and commissioning.

k.1 Print-outs on paper

The documents listed below are always printed on paper and delivered together with the units according to the Machinery Directive and the related national laws

This User Manual with;

- Declaration of incorporation – annex 1
- The unique technical data for this unit - annex 2
- Installation instructions including instructions for the Danfoss frequency converter – annex 4-12
- Printed form for Commissioning protocol - annex 13
- Test report – annex 14
- Short description about the main components in the control system – annex 15
- Wiring diagrams - annex 16
- Operator's guide for the Systemair control panel - annex 17

k.2 Electronic media

A DVD is delivered with every unit. The below-mentioned documents are available on every DVD and this means that every DVD is provided with information about many components that are not delivered with every unit. The documents on the DVD:

Common

- This User Manual
- Operator's Guide
- Commissioning Protocol as a Word-file for modification by the installer

Components in the control system

- Danfoss frequency converter
- Corrigo controller manuals
- Information about Building Management Systems
- Damper motors
- Filter guards
- Temperature sensors
- Fire thermostats
- Smoke detectors
- Pressure transmitters
- Valves
- Valve motors
- Humidity sensors
- CO2 sensor
- Humidity sensor
- Humidifier
- E-Tool software for fast communication with the Corrigo controller
- Other

k.3 Documentation is available for download from <https://techdoc.systemair.dk>

Your local Systemair company is able to provide the data.

k.4 Start-up by installer

All protection and safety measures must be met before start-up of the unit. The mains supply voltage must also be checked too. The mains supply voltage must be measured at the supply terminals in the cabinet.

k.4.1 Checklist, relevant values

k.4.1.1 Checklist prior to start-up

- Is the unit assembled correctly with its functions in the correct order? See annex 2.
- Are the sections and ducts assembled correct? See annex i.
- Check that fans and anti-vibration mounts are not damaged after transportation and installation.
- Is the rotary exchanger turning freely?
- Are safety guards installed correctly?
- If the unit includes integrated cooling (DVU), check whether it is installed and supervised by qualified service personnel.
- If the unit contains Electric air heater, make sure that the supply isolator disconnects with the unit.
- Ducts - are all ducts installed?
- External components - are the valve and valve motor installed correctly?
- Is the circulation pump installed correctly?
- Is water under pressure in the coil and circulation pump?
- Are the pressure transmitters installed and connected correctly? (If this is a system with pressure transmitters in the ducts)
- Main power supply:
 - Connected correctly? (3x400 V + N + PE)
 - Test of supply voltage for actuators and control signal!
 - Are control signals for actuators connected correctly?

k.4.1.2 Switch on power

Do not start until all safety procedures have been completed and ensure that inspection doors are closed and locked.

Switch on power and the unit should be ready for the start-up.

For start-up see the Operator's guide for the Systemair control panel - annex 17 (this manual is delivered with the unit – printed on paper and also available on the delivered DVD).

K.5 Adjustments and use

Adjust the factory set values for parameters on the Systemair Control Panel or via the software E-Tool on a PC. See the Operator's guide for the Systemair control panel - annex 17 (this manual is delivered with the unit – printed on paper and also available on the delivered DVD. Further information about the controller is available on the 100 pages in the Corrigo E28 User Manual that is available on the delivered DVD.

E-Tool software is also available on the delivered DVD and for download from a homepage.

K.6 Description of functions

K.6.1 Remote control

k.6.1.1 Communication WEB-master (TCP/IP Exoline) to PC and Android telephone

The controller has been prepared with a WEB-master interface (WEB side integrated) available when connected to a LAN network. It is possible via the LAN network to read values and to change some parameters – for example set-point temperatures, schedules, air flow capacity. It is possible to read and reset present alarms. There are 2 levels of login.

k.6.1.2 Communication to BMS systems with MODBUS

The controller has been prepared for communication via RS485 communication port to a MODBUS based BMS system (Building Management System).

The controller can work as a stand-alone system without any support from other controllers. Special setup of the controller for communication with the BMS system is not included in the delivery from Systemair.

k.6.1.3 Communication to BMS systems with LON

The controller has been prepared for communication via LON communication port to BMS systems (Building Management Systems). The port uses LonWorks according to the LonMark-guidelines. The LON-interface variables are available from Systemair. The controller can work as a stand-alone system without any support from other controllers. Special set-up of the controller for communication with the BMS system is not included in the delivery from Systemair.

k.6.1.4 Communication to BMS systems via BACnet

The controller has been prepared for BACnet TCP/IP interface. This can be used for communication with a BMS system (Building Management System).

The controller can work as a stand-alone system without any support from other controllers. Special set-up of the controller for communication with the BMS system is not included in the delivery from Systemair.

K.6.2 Extended operation and external start/stop (for example by presence detectors)

When the unit is running at reduced speed or is in shutdown mode, it can be forced up one step by using a Push button (impulse). The required number of minutes for the extended operation must be selected on the Systemair Control Panel. Button and cable are not delivered by Systemair. Furthermore when the unit is in shutdown mode it is possible to start/stop the unit by presence detectors. Presence detectors and cable are not delivered by Systemair.

k.6.3 Valve and valve motor for heating coil

The supply voltage for the water valve actuator is 24V AC, the control signal is 0-10 V. The sensor for water temperature has to be installed in the heating coil and the sensor is provided with cable but not connected to the terminals in the cabinet. The cable between valve motor and terminals in the cabinet is not delivered by Systemair. Standard valves are available for 2 or 3-way connection.

k.6.4 Valve and valve motor for cooling coil

The supply voltage for the water valve actuator is 24V AC, the control signal is 0-10 V. Cables between valve motor and terminals in the cabinet are not delivered by Systemair. Standard valves are available for 2 or 3-way connection.

k.6.5 DX cooling

A DX-cooler can be connected to the controller. Input and output are available for:

Start cooling – Alarm cooling – Cooling Y3. Cables are not delivered by Systemair

k.6.6 Circulation pump, heating

Circulation pump is not included in the delivery from Systemair. If the pump has not been activated for 24 hours, the pump is exercised once daily for 1 minute to keep the pump in a good condition. Cables are not delivered by Systemair.

k.6.7 Fire alarm function

k.6.7.1 External fire signal that indicate block or run

The unit is available without components for this function. The controller is as standard configured for ordinary running when the contact is closed (NC). By open contacts the fans stop and the dampers close. If disconnected, fire is indicated and the unit will stop until the signal is re-connected. On the site qualified technicians are able to change the configuration.

k.6.7.2 External fire signal

The unit is delivered without components for this function. The controller is as standard configured for ordinary running when the contact is closed (NC). By open contacts the fans stop and the dampers close. When the unit has been shut down by a fire signal, the unit has to be restarted on the control panel. On the site qualified technicians are able to change the configuration.

k.6.7.3 Two fire thermostats

The unit is available with 2 thermostats installed in the unit – 1 in the extract air and 1 in the supply air. The cut-off temperature in the thermostats is adjustable between 40 and 70°C. At the factory supply is set at 70°C and extract is set at 40°C. The controller is as standard configured to stop the fans and close the dampers if a thermostat is released. On the site qualified technicians are able to change the configuration.

k.6.7.4 One smoke detector in extract air

The smoke detector has been installed in extract air next to the fan. The controller is as standard configured to stop the fans and close the dampers if the detector is released by smoke. When the unit has been shut down by a fire signal, the unit has to be restarted on the control panel. On the site qualified technicians are able to change the configuration.

k.6.8 E tool - configuration tool

The installer can download the PC software called E tool from www.regincontrols.com and this software enables the installer to configure and supervise the function of the system via a graphic interface. This software displays all the parameters to be written in a commissioning report (the commissioning report is

available as a Word-file on the CD delivered with the unit). The TCP/IP port in the Corrigo E28 controller is prepared for communication with the E tool software.

k.6.9 Electrical heater battery

k.6.9.1 Control of heating capacity connected to unit with Systemair control system

Electrical heater installed with separate controller beside the heater. The separate controller is designed for capacity conversion of the 0-10 V control signal from the main control system. The electric heater is not supplied from the air handling unit cabinet as the cabinet is not designed to supply the heater with power. No power supply cables are connected to the electric heater. The separate controller is without supply disconnecting device

k.6.9.2 Control of heating capacity connected to unit without Systemair control system

Electrical heater installed with separate controller beside the heater. The separate controller is designed for capacity conversion of the 0-10 V control signal from the main control system. The heating capacity is adapted in steps.

The electric heater is not supplied from the air handling unit cabinet as the cabinet is not designed to supply the heater with power. No power supply cables are connected to the electric heater. The separate controller is without supply disconnecting device.

k.6.10 Speed control of fans

k.6.10.1 TIME control system – EC motors

Fan motor revolutions are controlled by the EC motors. The EC motors are configured and tested to comply with the data of the unit.

k.6.10.2 DV control system - frequency converters inside the unit are IP 20

Fan motor revolutions are controlled by frequency converters, and they are configured and tested to comply with the data for the unit. The frequency converter for each fan motor is installed inside the unit beside the fan motor with cables between motor and converter. In units with complete control system the frequency converters are delivered with system parameters adapted to the motors and the project.

k.6.10.3 Pressure transmitters

Separate control of the air flow or duct pressure for supply fan and for extract fan. The required air flow or duct pressures with normal as well as reduced capacity are selected on the Systemair Control Panel. The actual pressure is measured by pressure transmitters. PI calculation in the controller continuously transmits the necessary revolutions for the fans to the frequency converters to achieve the required pressure.

k.6.10.4 CO₂-dependent air flow

The air flow is controlled by a CO₂ sensor. High CO₂ concentration is equal to higher air flow. Low CO₂ concentration is equal to lower air flow. Based on the actual CO₂ level and a min/max level, the needed airflow is calculated. The speed of each fan is adjusted via frequency converter. Terminals in the cabinet are available for connection of the sensor.

k.6.10.5 Humidity dependent air flow

The air flow is controlled by the humidity sensor. High humidity is equal to higher air flow. Low humidity is equal to lower air flow. Based on the actual humidity level and a min/max level the needed airflow is calculated. The speed of each fan is adjusted via frequency converter. Terminals in the cabinet are available for connection of the sensor.

k.6.11 Cabinet

k.6.11.1 Integrated cabinets in TIME units

TIME units are delivered with 2 integrated cabinets. One cabinet in the supply fan section and one cabinet in exhaust fan section. Both cabinets are installed behind inspection doors. External components must be connected to terminals in the cabinet in the supply fan section.

k.6.11.2 Integrated cabinet in DV units with control system

Cabinet is integrated in the unit behind an inspection door. Terminals are installed in the cabinet for all external components. The number of terminals is always adapted to the individual order.

k.6.11.3 Cabinet placed on the DV unit with control system

The models with the cabinet on the unit are exclusively for indoor installation. Terminals are installed in the cabinet for all external components. The number of terminals is always adapted to the individual order.

k.6.12 Temperature sensors

Four sensors are always delivered with each unit. See below where the sensors are placed;

- 1 sensor in the extract air, installed inside the unit
- 1 sensor in the outdoor air, installed inside the unit before the supply air filter on the cold side of the heat exchanger
- 1 sensor in the supply air to be placed in the supply air duct by the installer
- 1 sensor in the exhaust, installed inside the unit

k.6.13 Damper motors

Four different types of damper motors are available;

- On/off damper motor, not modulating, without spring function. Torque is 20 Nm and run time is 150 seconds
- On/off damper motor, modulating, without spring function. Torque is 20 Nm and run time is 150 seconds
- Spring-return damper motor, not modulating, with spring function. Torque is 20 Nm and run time is 150/16 seconds
- Spring-return damper motor, modulating, with spring function. Torque is 20 Nm and run time is 150/16 seconds

k.6.14 Filter guards

Filter guard over pre-filter and primary filter installed and connected to the controller for display of alarm when the mechanically set limit is exceeded. Filter alarm will be displayed on the Systemair Control Panel.

k.6.15 Room temperature sensors

One or two external room temperature sensors are available. The cabinet has been prepared with additional terminals for connection of the room temperature sensors. The sensors are delivered without cable. The controller calculates an average of the value from the 2 sensors as input for the control.

k.6.16 Frost protection

For the frost protection of the heating coil, the water temperature in the coil is transmitted to the controller by a temperature sensor in a water return circuit of the coil. The controller always generates a signal to the valve motor that keeps a sufficient flow of hot water to protect the coil against frost. This frost protection is also activated when the running mode is "off".

If the water temperature falls below the set point temperature the fans stop, the dampers close, and an alarm is activated.

From Systemair every heating coil for hot water is provided with a little pipe at the collection pipe for the return water. This little pipe is prepared for the installation of the above mentioned temperature sensor for the transmission of the return water temperature to the controller.

k.6.17 Systemair Control Panel - SCP

The separate cable-connected (10m) hand terminal with display and buttons – the Systemair Control Panel is always necessary for the normal handling and programming, because the main Systemair E28 controller is without display and buttons.

k.6.18 Cooling recovery

If the extract air temperature is lower than the outdoor air temperature, and there is a cooling demand in the rooms, the cooling recovery will be activated by reversing the heat exchanger signal. The signal is increased to the cooling recovery by increasing cooling demand.

k.6.19 Free cooling

A temperature sensor has been installed inside the unit in the outdoor air entrance. If the outdoor temperature after midnight is below the room temperature set point and the actual average room temperature is above the set point temperature, the fans start during the summer to cool down the building during night hours.

k.6.20 Alarm signal

By alarm there are 24 V DC on terminals in the cabinet. Lamps and cables are not available from Systemair.

k.6.21 Heat recovery

The heat recovery capacity is controlled by modulating speed of the rotor

k.6.22 Frost protection – plate heat exchanger

To prevent the plate heat exchanger from being blocked and damaged by ice when the outdoor air temperature is very low, the exhaust air temperature from the coldest area after the heat exchanger is transmitted to the controller by a temperature sensor. The dampers are controlled by modulating damper motor or damper motors to reduce the flow of outdoor air through the exchanger and to increase the flow of outdoor air through the bypass duct. By this sequence the risk of ice blocking of the exchanger is reduced and please note the capacity of the heating battery is sufficient for heating this mixture of preheated and not preheated supply air.

k.7 Commissioning

When the installer has completed the installation and wants to hand over the finished installation to his customer for payment the commissioning protocol can be the written receipt for the full ended job. Fill in the blank spaces and sign the proposed commissioning protocol that is annex 13, or fill in the Word-file with a Commissioning Protocol that is included on the DVD delivered with the unit.

I. Information about the residual risks that remain despite the inherent safe design measures, safeguarding and complementary protective measures adopted.

I.1 Unit casing.

I.1.1. Design of the machine to make transport safe

Hazards/dangerous area:

Incorrect handling during transportation may cause that the unit is dropped.

Dangerous incident:

If a person is hit by a unit that is dropped, this could in unfortunate circumstances lead to irreversible injury or death.

Claim for reduction of danger:

Correct handling during transportation is described in this manual. If lifted by fork-lift truck the forks of the truck must be sufficiently long. Safety measures are also described in this manual by use of crane.

Information about weight of each section is also visible.

1.2 Common for all unit sections

1.2.1 Risk caused by surfaces, edges and corners

Hazards/dangerous area:

Sharp edges on plates might occur inside the machines as well as sharp edges on frames of dampers. No sharp edges on the outside of the units.

Dangerous incident:

Cut fingers/hands.

Claim for reduction of danger:

Risk only exists during maintenance and cleaning. This takes place at least once every year. Use of gloves and helmet is described in this manual. Cut-resistant gloves for protection against injury from sharp metal plate edges. Use CE-marked gloves for this purpose. Lamps mounted inside the unit with sufficient lighting reduce the risk of injury.

1.3 Common for all unit sections by insufficient lighting

1.3.1 Risk caused by insufficient lighting inside sections

Hazards/dangerous area:

On the floors of the units there are handles to hold filters, profiles for the carrying of fan motors. Cables are between fan motors and frequency converters.

Dangerous incident:

By insufficient lighting, the above-mentioned obstacles are not visible with the risk of stumbling that becomes a fall, leading in unfortunate circumstances to irreversible injury or death.

Claim for reduction of danger:

Risk only exists during maintenance and cleaning. This takes place at least once every year. According to this manual and in the SystemairCAD software for configuration and selection of accessories, lamps for sufficient lighting inside the units are mandatory according to the latest interpretations of the Machinery Directive by the authorities. Use of helmets reduces the risk of injury.

1.4 Dampers type DVA – DVB – DVM – DVP – Bypass dampers in DVQ

1.4.1 Risk caused by maintenance and cleaning of dampers

Hazards/dangerous area:

Are between the damper blades and the system of bars and links between motor and damper blades.

Dangerous incident:

Crushing of fingers.

Claim for reduction of danger:

Examination is still under preparation in our own laboratory. Still no voluntary test persons are available.

1.5 Attenuators type DVD

1.5.1 Risk caused by maintenance and cleaning of attenuators

Hazards/dangerous area:

High concentration of dust on the surface of the baffles might be harmful to the health.

Dangerous incident:

To breathe in particles that is harmful to the health.

Claim for reduction of danger:

Risk only exists during maintenance and cleaning. This takes place at least one time every year. Use of particulate respirator is described in this manual. Particulate respirator – maintenance free including foam face-seal and adjustable pre-threaded headbands (same particulate respirator as recommended for change of filters).

1.6 Filters type DVG – DVF

1.6.1 Risk caused by missing change of filters

Hazards/dangerous area:

Missing change of filters and missing maintenance decrease the capacity and final consequence will be breakdown.

Dangerous incident:

By extensive lack of of filter change and maintenance the machine can break down.

Claim for reduction of danger:

In the manual is the method and schedule for change of filters and maintenance specified.

1.6.2 Risk caused by the execution of filter change

Hazards/dangerous area:

Filter panels and filter bags

Dangerous incident:

To breathe in particles that is harmful to the health.

Claim for reduction of danger:

Use of particulate respirator – maintenance free including foam face-seal and adjustable pre-threaded headbands (same particulate respirator as recommended for cleaning of attenuators).

1.7 Plug fans type DVE

1.7.1 Risk caused by lightning strike

Hazards/dangerous area:

Lightning strike close to the machine.

Dangerous incident:

Lightning strike can create flash over between phases and conductive parts. This can cause fire or the overvoltage can make injury on persons

Claim for reduction of danger:

Installer and user must be aware of the fact that lightning makes a risk that requires installation of overvoltage protection devices to lead the lightning overvoltage to an earth lead on a safe way. The need for overvoltage protection devices depend on where the unit is placed in and on the building.

Installer and user must take care of this according to local statutory requirements. Overvoltage protection devices are also described in section i.3.3.3 of this manual.

1.7.2. Risk caused by permanent magnet motor

Hazards/dangerous area:

Rotation of the shaft generates electricity. This danger is always visualized by a yellow warning label on the inspection door where permanent magnet motors are installed.



Dangerous incident:

Persons touching conductive parts get electric shock, burns, heart flicker and so on.

Claim for reduction of danger:

By installation or repairs of conductive components, the shaft must be blocked to prevent any rotation.

1.7.3 Risk of rotating impeller caused by stack effect (chimney effect).

Hazards/dangerous area:

On special occasions stack effect – also called chimney effect – in the ducts create airflows that drives the impellers by turned off motors.

Dangerous incident:

Injury of fingers, hands and arms.

Claim for reduction of danger:

Eliminate this airflow for supply air and exhaust air by dampers with spring return motors for automatic closing of the dampers by turned off fan motors and by power failure.

1.8 Batteries for heating and cooling type DVR – DVH – DVK, cooling compressor

1.8.1 Extreme temperatures - heating

Hazards/dangerous area:

Electrical heating elements can achieve surface temperature of 500 degree Celsius.

Batteries and pipes for hot water can achieve 95 degree Celsius.

Dangerous incident:

According to ISO 13732-1:2006, here is no direct risk of burns. (short-time contact – lesser than 2,5 sec).

Claim for reduction of danger:

No.

1.8.2 Extreme temperatures - cooling

Hazards/dangerous area:

Evaporator batteries and pipes connected to cooling compressor can achieve minus 10 degrees Celsius.

Dangerous incident:

According to ISO 13732-1:2006, here is no direct risk of burns. (short-time contact – lesser than 2,5 sec).

Claim for reduction of danger:

No.

1.9 Cooling compressor units type DVU – DVU-C

1.9.1 Risk of high temperature

Hazards/dangerous area:

Condenser batteries and pipes can achieve temperature of 60 degree Celsius.

Dangerous incident:

Vurderet ud fra ISO 13732-1:2006, der er umiddelbart ikke risiko for forbrændinger. (berøringstid 2,5 sek).

Claim for reduction of danger:

No.

1.9.2 Risk caused by lightning strike

Hazards/dangerous area:

Lightning strike close to the machine.

Dangerous incident:

Lightning strike can create flash over between phases and conductive parts. This can cause fire or the overvoltage can make injury on persons

Claim for reduction of danger:

Installer and user must be aware of the fact that lightning makes a risk that requires installation of overvoltage protection devices to lead the lightning overvoltage to an earth lead on a safe way. The need for overvoltage protection devices depend on where the unit is placed in and on the building.

Installer and user must take care of this according to local statutory requirements. Overvoltage protection devices are also described in section i.3.3.3 of this manual

m. Instructions on the protective measures to be taken by all service technicians during repair and maintenance

Use the below-mentioned personal protective equipment for maintenance:

- Cut-resistant gloves for protection against injury from sharp metal plate edges. Use CE-marked gloves for this purpose.
- Helmet
- Particulate respirator – maintenance free including foam face-seal and adjustable pre-threaded headbands – for replacing filters.
- Padlock for locking the automatic circuit breakers in off position
- Permanent magnet motor. The shaft must be blocked during repairs and maintenance of the electric system (the motor generates electricity by rotation – for example that the wind and thermic drives the fan/motor).
- Lighting inside the units. According to the latest interpretations of the Machinery Directive by the authorities sufficient lighting inside the units is mandatory.
- Tools to block the impeller during repairs and maintenance if stack effect – also called chimney effect – in the ducts create airflows that drives the impellers by turned off motors

n. The essential characteristics of tools which may be fitted to the machinery

The subject in the Machinery Directive about tools on the machine does not exist for the TIME and DV air handling units, because those tools does not exist.

o. The conditions of stability during use, transportation, assembly, dismantling when out of service

The unit must always be handled in an upright position. Never tilt any section more than 15 degrees. If sections must be tilted more than 15 degrees, sections with fans or rotating exchangers that can be drawn out for service must be secured carefully.

During transportation, installation, dismantling or other handling, it must be secured that all components in the unit are properly fastened and with additional attention to the control of anti-vibration mounts under

the fans that they are undamaged. The mounting and smooth running of the fans must be controlled and handled with great care.

o.1 Installed reliable to avoid units to be tilted or moved by the any storm.

Units installed on roofs and other places with the risk of heavy winds must be installed reliable to avoid that they can be tilted or moved by the any storm. The base frame is provided with holes that are intended for fastening by sufficient bolts and fittings supplied by the installer.

o.2 Transport of section with cooling compressor unit

During transportation, the unit section – DVU and DVU-C - **must** always be in the upright position or tilted less than 30°. If it is necessary to tilt the unit more than 30°, the suction pipe of the compressor must point upwards to prevent the escape of oil from the compressor sump.

o.3 Disposal of the cooling compressor system - type DVU and DVU-C

Prior to the disposal of the DVU or DVU-C unit section, the refrigerant in the cooling system must be drained off by a skilled technician from a certified company. After correct evacuation of the refrigerant, the disposal of the DVU or DVU-C unit section is similar to the disposal of the rest of the air handling unit.

o.4 General disassembly – sharp edges

Pay attention to several sharp edges during dismantling and disposal of the unit. To avoid injury, CE-marked cut-resistant gloves as well as helmet must be used. The measures are described further in the Maintenance, Dismantling and Disposal Manual.

p. Instructions for machinery where these are regularly to be transported

The subject in the Machinery Directive about machinery that are regularly to be transported does not exist for the TIME and DV air handling units, because those units are for specially made for one intended application.

q. The operating method to be followed in the event of breakdown. Safe restart.

Use the below mentioned procedure in the event of breakdown or blockage:

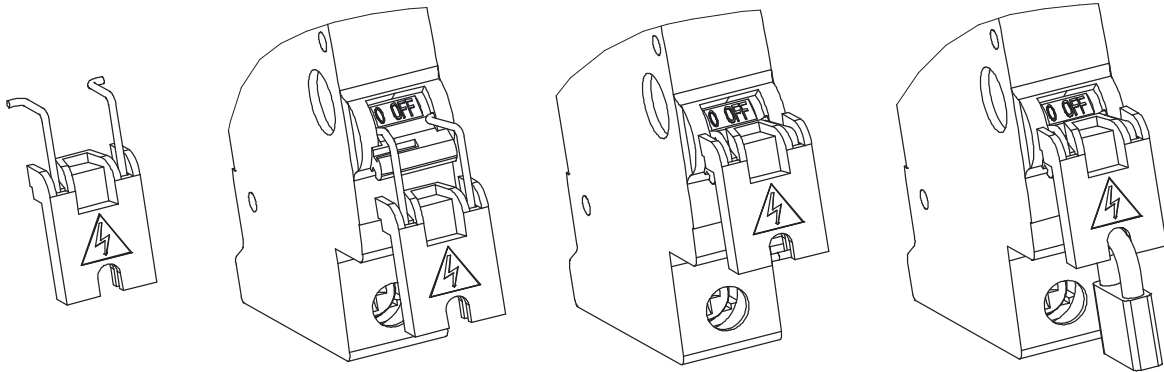
- Switch off the power and lock the supply disconnecting device in the off position.
- Remove the reason for breakdown or blockage.
- Follow the start-up procedure described in section k.

r. Adjustment and maintenance operations

Must be performed by skilled technicians.

r.1 Shutdown of the unit to a safe state.

Switch the unit to OFF on the Systemair Control Panel. See the - Operator's Guide – Annex 17. Switch off the automatic circuit breakers and block them by padlocks. The automatic circuit breakers are marked F1 to F4. See the illustration below about how to place a padlock on each automatic circuit breaker.



Check that the automatic circuit breaker marked F5 is still switched on because the lamps inside the unit, and only those lamps, are connected to this switch. Switch on the lamps for light during the maintenance activities.

Use the start-up procedure described in section k, when the maintenance activities are completed.

r.2 Recommended maintenance intervals

| Function | Maintenance | Number per year |
|--------------------------------------|--|-----------------|
| Unit casing | Cleaning of the unit casing. | 1 |
| | Control of rubber seals on doors and between sections. | 1 |
| Filters | Change on demand by alarm and always minimum twice a year. | 2 |
| | Control of rubber seals. Control of the system with lateral locking rails and handles on TIME and DV10 – DV150. Control of the filter bank frames with fasteners on DV190 and DV240. | 2 |
| Fans | Cleaning of all parts. | 1 |
| | Check motors and bearings | 1 |
| | Check that the impellers are rotating without dissonance. | 1 |
| | Check that anti-vibration mounts are intact. | 1 |
| | Check that the unit is operation without vibrations after the cleaning, overhaul and maintenance. | 1 |
| Rotary heat exchanger | Check that leakage and dirt accumulation is insignificant | 1 |
| | Check that the rotor can turn freely and easily manually with a hand when the belt is removed from the drive | 1 |
| Plate heat exchanger | Check bypass function and sequence for de-icing | 1 |
| Run-around heat exchanger | Check the exchanger function and test the frost protection. The glycol must be without additives and auto glycol must not be used. | |
| Dampers | Test the operation. | 1 |
| | Visual inspection of seals and tightness when closed. | 1 |
| Hot water battery | Check the dirt accumulation and clean, if needed. | 1 |
| | Bleeding, if needed. | 1 |
| | Test of frost protection sequence | 1 |
| | Test of cirkulation pump | 1 |
| Electric heating battery | Check dirt accumulation and clean, if needed. | 1 |
| | Test the function of the system with the fuses for the safety. | 1 |
| Cooling battery | Check dirt accumulation and clean, if needed. | 1 |
| | Test the frost protection (glycol) | 1 |
| Cooling compressor unit | Mandatory annual control of the compressor system. Must be done by certified technician from a certified company. | 1 |
| Condensate drain | Cleaning of tray, water trap and outlet. Check the electrical heating between insulation and pipes, if installed. | 1 |
| Saving- and comfort functions | Test of CO2 sensor, humidity sensor, motion sensor, pressure transmitters for air capacity control, extended operation via button, cooling recovery, free cooling | 1 |
| Fire alarm | Test of thermostats, smoke detectors and fire detection systems | 1 |
| Battery in controller | Change the battery on demand by alarm in the display and always change the battery as a minimum every 5. Year. | 1 |
| Remote control | Test of Communications. | 1 |

r.3. Filters – sizes and numbers

Filters in supply air and in extract air are always the same sizes and the same numbers. See the filters in supply or extract air below. REMEMBER to order filters for supply as well as for extract.

| Size of unit | Numbers and sizes of frames for bag filters (WxH) |
|--------------|---|
| 10 | 1x[792x392] |
| 15 | 2x[490x392] |
| 20 | 1x[490x490] + 1x[592x490] |
| 25 | 2x[592x592] |
| 30 | 1x[592x592] + 1x[490x592] + 1x[287x592] |
| 40 | 3x[490x742] |
| 50 | 3x[592x490] + 3x[592x287] |
| 60 | 8x[490x490] |
| 80 | 4x[490x592] + 4x[490x490] |
| 100 | 4x[592x592] + 4x[490x592] |
| 120 | 4x[592x592] + 4x[592x490] + 4x[592x287] |
| 150 | 9x[592x490] + 6x[490x490] |
| 190 | 15x[592x592] |
| 240 | 15x[592x592] + 3x[287x592] + 5x[592x287] |

| Size of unit | Numbers and sizes of frames for panel filters (WxHxD) |
|--------------|---|
| 10 | 2x[376x376x44] |
| 15 | 2x[448x448x44] |
| 20 | 1x[241x495x44] + 1x[495x495x44] + 1x[391x495x44] |
| 25 | 2x[445x622x44] + 1x[391x622x44] |
| 30 | 3x[445x622x44] |
| 40 | 6x[495x368x44] |
| 50 | 6x[622x391x44] |
| 60 | 8x[495x495x44] |
| 80 | 4x[495x495x44] 4x[495x597x44] |
| 100 | 10x[445x622x44] |
| 120 | 15x[495x445x44] |
| 150 | 21x[391x495x44] |
| 190 | 15x[592x592x25] |
| 240 | 15x[592x592x25] + 3x[287x592x25] + 5x[592x287x25] |

NOTE that special sizes of filters are available by Camfil.

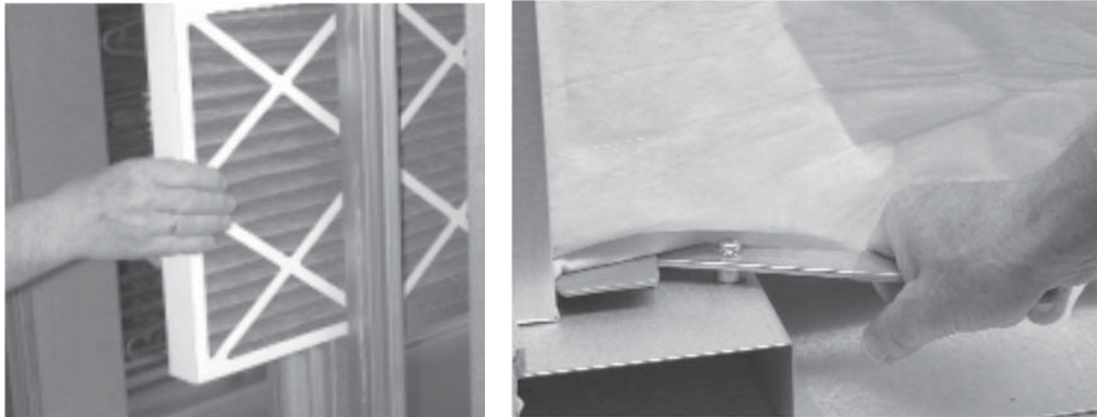
r.3.1 Bag filters

Release the bag filter cells by activating the handles and pull out the filter cells of the unit casing. The frame profiles are to be cleaned and all seals checked for damage. The handles and locking guide rails are also to

be checked to ensure that they can operate unobstructed. The new filter bags must be pushed carefully into the unit in order to ensure that they are sealed properly. The various filter sizes should be placed in an order corresponding to the way in which the unit is designed, and the filters must have vertical bags.

r.3.2 Panel filters

The filter cell guide rails are to be cleaned before fitting the new filters.

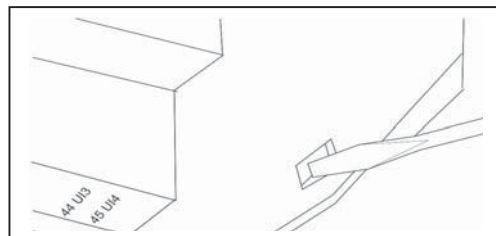


r.4. Changing the Internal Battery in the controller

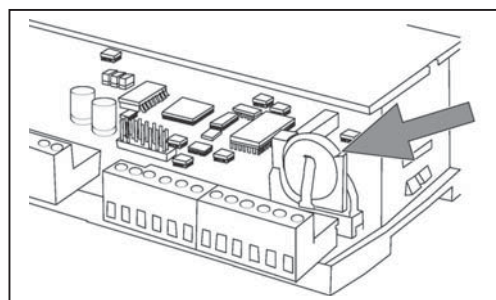
Note: This procedure requires knowledge of proper ESD protection; i.e. an earthed wristband must be used! When the alarm "Internal Battery" is activated and the battery LED lights up red, the battery for backup of program memory and real-time clock has become too weak. The battery is replaced as described below. A backup capacitor saves the memory and keeps the clock running for at least 10 minutes after the power supply is removed. Therefore, if the battery replacement takes less than 10 minutes, there will be no need to reload the program, and the clock will continue to run normally.

The replacement battery must be of the type CR2032.

Remove the cover by pressing down the locking torques at the edge of the cover using a small screwdriver, and at the same time pulling the edges outwards.



Grip the battery firmly with your fingers and lift it upwards until it rises from its holder. Press the new battery firmly down into place. Note that to preserve correct polarity; the battery can only be inserted the "right way round".



r.5 Other functions to maintain

r.5.1 The unit

The unit should be cleaned once a year when operating with normal air quality for comfort ventilation with no special hygiene requirements.

To clean the unit, dry it off with a dry cloth, or use water mixed with a non-corrosive cleaning medium.

Any corrosion i.e. at the filters should be cleaned off immediately, and the surface treated.

In special operating conditions, where the air is aggressive or very humid, for example, or where there are special hygiene requirements, the unit shall be cleaned more frequently as required.

Cleaning medium and method should be adapted to the relevant conditions. Any corrosion should be cleaned off immediately, and the surface treated.

Closing mechanisms are to be lubricated at least once a year. Synthetic door hinges are service free. Seals around inspection doors are to be cleaned at least once a year and are to be checked for leakage.

It is recommended to treat the seals with a moisture repellent agent. Connecting pieces for the unit sections, including the Disc-Lock types, are to be checked for tightness at least once a year.

All seals are to be inspected at least once a year and are to be repaired if necessary.



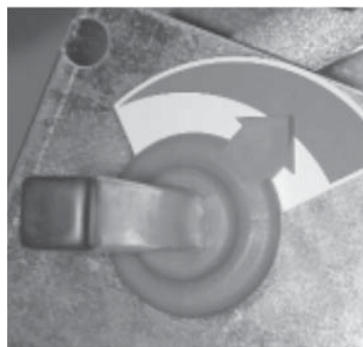
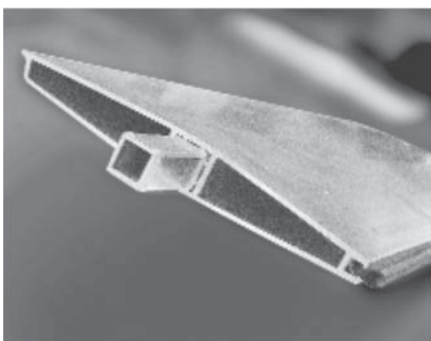
Grilles for air intake and exhaust air outlet are to be cleaned at least once a year to prevent blockage.

r.5.2 Dampers

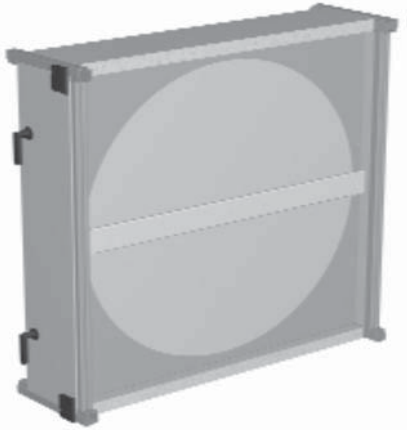
Rubber seals between the damper blades themselves and between the damper blades and the frame are to be checked once a year. These seals are not to be lubricated or treated in any other way.

Each damper blade is connected by a pivoting system. The steel rods and brass bushes do not require lubrication.

The damper blades are fitted with synthetic bearings requiring no lubrication. Air-tightness of the damper, when the damper motor is in the closed position, must be visually checked once a year. The damper motor is to be adjusted if the damper does not close tightly.



r.5.3 Rotary heat exchanger DVC



r.5.3.1 Rotor

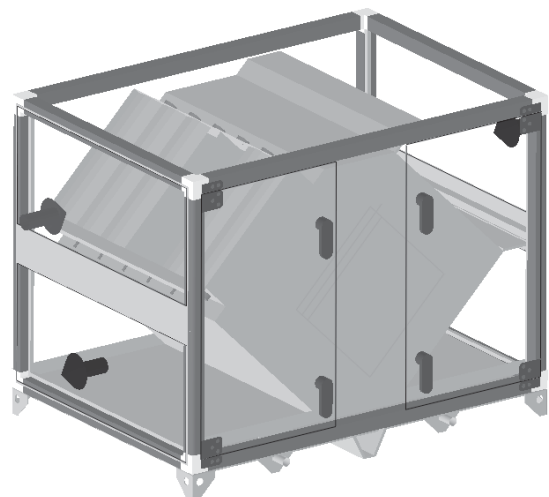
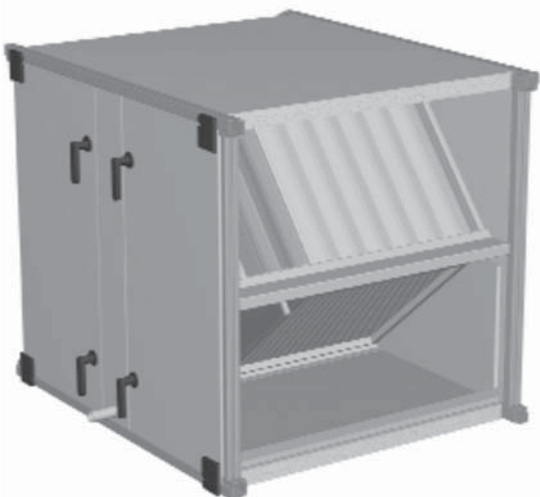
The rotor is to be checked at least once a year to ensure that it can turn freely and easily. This can be done by removing the belt drive at the motor and then turning the rotor manually with a hand on the peripheral rotor casing. At the same time the brush seals are to be checked for damage. The bearings are factory lubricated and do not require any service lubrication. During operation the rotor can become dirty. The rotor can be cleaned by blowing through with compressed air.

To ease inspection and service the rotor can be pulled out of the sizes 10, 15, 20, 25 og 30.

r.5.3.2 Motor and belt drive

The bearings are factory lubricated and do not require any service lubrication. The belt drive is to be checked for correct tightness and that it is undamaged. On smaller AHU, the rotor is fitted with an elastic belt drive and supplied with a reserve belt on the rotor. This belt drive does not require service and cannot be shortened. A new belt can be fitted using specialist tools. On larger heat exchangers the rotor has a V-belt with a belt connector. If the belt is no longer tight, it must be shortened to a length which enables the motor base frame tightening spring to hold the belt tight. If new screws are used for the belt connector, they must not have a length which exceeds the thickness of the belt and connector. Remove the excess, if any, with a file.

r.5.4 Cross flow and counter flow exchanger



Once a year the edges of the heat exchanger plates are to be checked for cleanliness and damage. If there is dust on the edges of the plates, remove it with a soft brush. If grease or other such substances are present, then the edges must be washed using grease dissolving detergents.

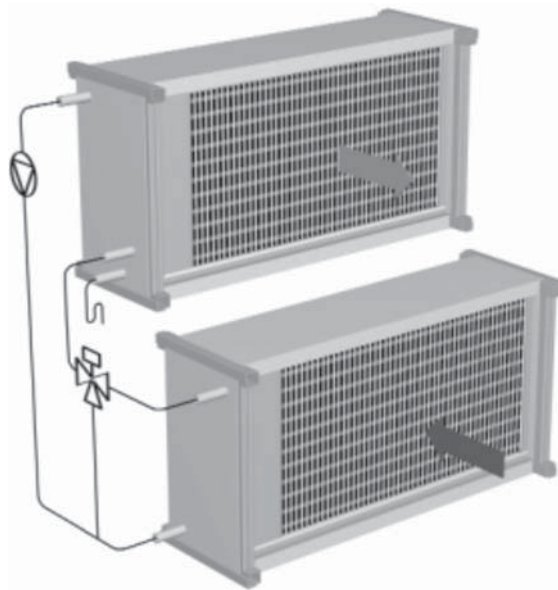
r.5.4.1 By-pass damper

The damper blades are fitted with synthetic bearings requiring no lubrication. Each damper blade is connected by a pivoting system. The steel rods and brass bushes do not require lubrication. Air-tightness of the dampers, when the damper motor is in the closed position, must be visually checked once a year. The damper motor is to be adjusted if the damper does not close tightly.

r.5.4.2 Condensate water drain

Once a year clean the drip tray beneath the heat exchanger, as well as the drain and the water trap. Take care that there is sufficient water in the water trap. If a droplet eliminator has been fitted, this must be checked once a year and cleaned if necessary.

r.5.5 Run-around heat exchanger DVR



A heat recovery system of this type consists of a heating coil in the supply air- flow and a cooling coil in the exhaust air- flow. After an extended running period (normally a few years) dust particles can accumulate on the surface of the coils. This can reduce the efficiency of the coils. Cleaning must be carried out with the utmost care to ensure that the coil fins are not damaged.

The piping system must be vented once a year as air in the system can significantly reduce the capacity of the coils.

r.5.5.1 Pump and pressure expansion

The service instructions issued by the pump manufacturer must be followed. The pressure expansion system must be checked once a year. If necessary, the pressure must be increased to the correct level.

r.5.5.2 Condensate water drain

Once a year clean the drip tray beneath the heat exchanger, as well as the drain and the water trap. Take care that there is sufficient water in the water trap. If a droplet eliminator has been fitted to the cooling coil, this must be checked once a year and cleaned if necessary.

r.5.6 Heating coil DVH, cooling coil DVK and change over coil DVHK

After an extended running period (normally a few years) dust particles can accumulate on the surface of the coil. This can reduce the efficiency of the coil. Cleaning must be carried out with the utmost care to ensure

that the coil fins are not damaged. The piping system must be vented once a year as air in the system can significantly reduce the capacity of the coil.

r.5.6.1 Heating battery

Check that the frost protection system is fully operational. A battery may burst due to frost if the frost protection system is not operational.

r.5.6.2 Cooling battery

Once a year clean the drip tray beneath the cooling coil, as well as the drain and the water trap. Take care that there is sufficient water in the water trap. If a droplet eliminator has been fitted to the cooling coil, this must be checked once a year and cleaned if necessary.

r.5.6.3 Electric heating battery

Check that the built-in safety thermostat with an automatic reset function and the overheat thermostat with manual resetting are fully operational.



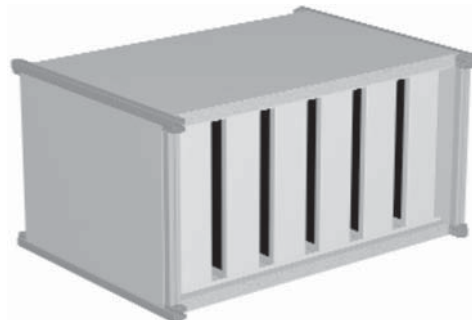
r.5.7 Plug fans DVE

Dust can accumulate on the fan impeller which can cause imbalance and vibrations. The fan impeller must therefore be checked once a year and cleaned, if necessary. Anti-vibration mounts and flexible connections should be checked at the same time. If the anti-vibration mounts are damaged in any way they must be replaced.

r.5.7.1 Motor

The motor are usually fitted with factory lubricated bearings which require no further lubrication. Larger motors can be fitted with greasing nipples and bearings which require regular lubrication. Lubricating these types of bearings must be carried out according to the manufacturer's instructions.

r.5.8 Silencer DVD



During operation dust particles can accumulate on the surface of the baffles. Silencers that are designed for dry and wet cleaning are fitted with baffles that can be extracted from the unit casing. Large inspection doors give access to easily extraction of the baffles. Baffles designed for dry cleaning can be cleaned using a soft brush or they can be vacuum cleaned. Baffles designed for wet cleaning can be washed down using a soft brush and soapy water. The detergent used must be non-aggressive. After washing, the baffles must be wiped dry with a cloth. Remember to clean the inside surface of the unit casing before refitting the baffles.

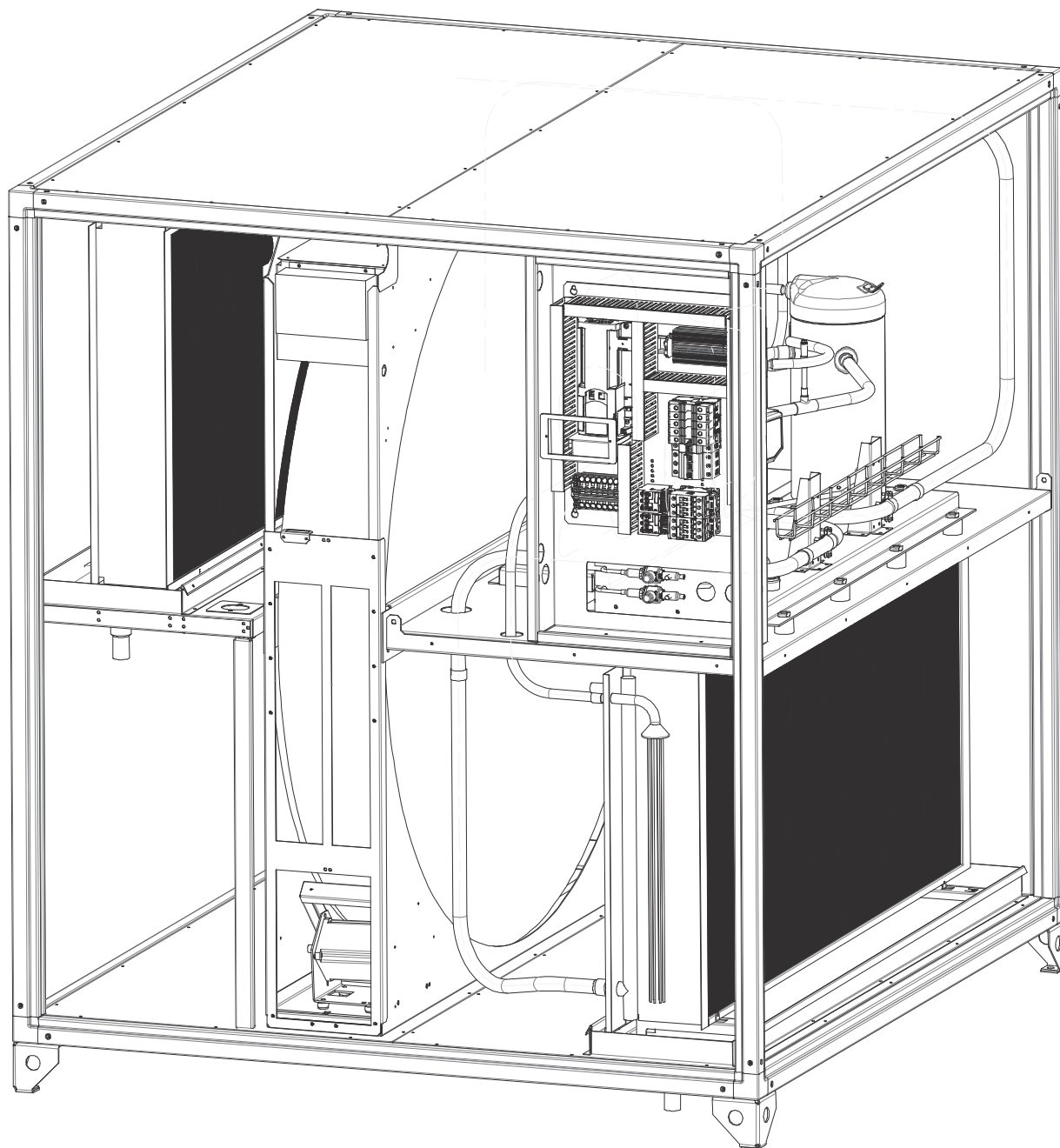
r.5.9 Outdoor air section DVY



Dust and dirt can accumulate in this section. Large inspection doors give access for cleaning.

r.5.10 Heat pump unit – DVU-HP

Mandatory annual control must be done by certified technicians from a certified company. See further description in annex 10 and 11.



s. Instructions designed to enable adjustment and maintenance to be carried out safely, including the protective measures that should be taken during these operations

s.1. Protective measures and additional protective measures

Adjustment and maintenance must be done by skilled technicians – usually based on service contracts for some years or long-term ESCO contracts.

The units are provided with guards to avoid unintended hazards and injury because of rotating parts in the unit. The potential sources of harm are the fans with fast rotating impellers. Hazards from the impellers are obvious during operation, but when power is cut-off, the impellers are still potential hazards due to after-run for at least 20 seconds. Notice that even cut-off the impellers are still potential hazards.

The fan guard's are the inspection doors and the doors are provided with locks. Inside the doors are additional protection installed – guards that only can be removed by use of tools.

Other motor-driven parts are dampers with damper motors and rotary heat exchangers, but the movement is so slow that guard measures are not necessary. Just keep your hands away from places with risk of injury. Use particulate respirator when filters are replaced.

s.1.1 Necessary protection measures prior to start-up.

Ensure that all protection measures are installed correct before start-up.

s.1.1.1 Design of protection measures

Inside the doors are additional protection installed – guards that only can be removed by use of tools.

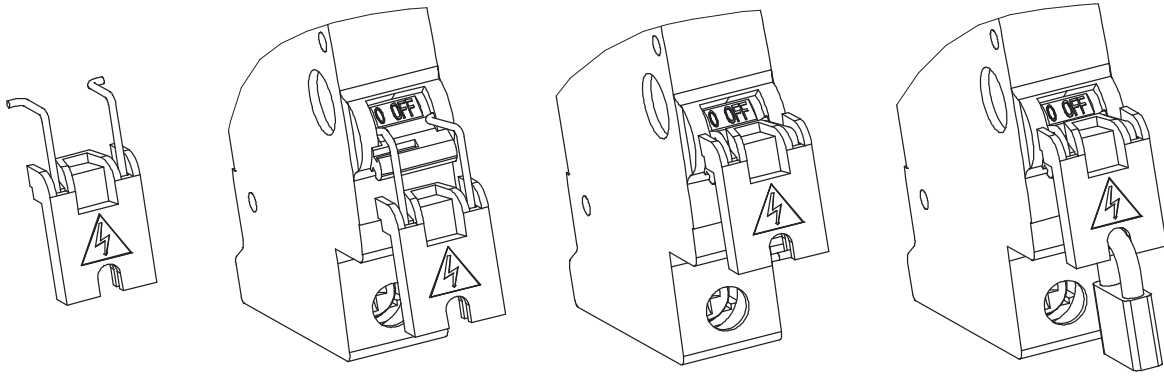
s.1.1.2 Configuration of frequency converters with installed guard

A frequency converter is mounted beside the fan in some units. If the configuration of frequency is carried out with the fan in operation, the guard must be installed for safety reasons and a long cable must be installed between the frequency converter inside the unit and the control panel outside the unit.

s.1.2 Safe adjustment and maintenance

Before maintenance and repair, the unit must be switched off by switching off the automatic circuit breakers and block them by padlocks. The automatic circuit breakers are marked F1 to F4. See the illustration below about how to place a padlock on each automatic circuit breaker. Check that the automatic circuit breaker marked F5 is still switched on because the lamps inside the unit, and only those lamps, are connected to this switch. Switch on the lamps for light during the maintenance activities (note that the lamps are an accessory – only installed, if ordered).

Use cut-resistant gloves for protection against injury from sharp metal plate edges. Use CE-marked gloves for this purpose. Use helmet during maintenance work in the unit.



s.1.3 Personal protective equipment for maintenance staff – health and safety

Use the below-mentioned personal protective equipment for maintenance:

- Cut-resistant gloves for protection against injury from sharp metal plate edges. Use CE-marked gloves for this purpose.
- Helmet
- Particulate respirator – maintenance free including foam face-seal and adjustable pre-threaded headbands – for replacing filters.
- Padlock for locking the above mentioned automatic circuit breakers.
- Permanent magnet motor. The shaft must be blocked during repairs and maintenance of the electric system (the motor generates electricity by rotation – for example that the wind and thermic drives the fan/motor).

t. The specifications of the spare parts to be used, when these affect the health and safety of operators

DV and TIME units are operating automatically. Operators can control the unit by the Systemair control panel.

t.1 Spare parts - Mechanical

Annexe 3 - available on demand

t.2 Spare parts - Electrical

Annexe 3 – available on demand

u. Information on airborne noise emissions exceeding 70 dB(A)

Due to the design and construction of the units the (A) weighed sound pressure level from fans and other components do not exceed 70 dB (A) outside the units.

Overview of annexes

Annexes 1, 2, 3, 13 and 14 are enclosed in a separate cover.

Annex 1 Declaration of conformity with unique production number.

Printed on separate page and delivered with every unit. Enclosed in separate cover.

Annex 2 Technical data – unique data for every unit

Printed on separate pages and delivered with every unit. Enclosed in separate cover.

Annex 3 spare part lists

Printed on separate pages but not delivered with every unit. Available on demand.

Annex 4 Assemble base frames – height 150 mm for units in the sizes 10-40

Annex 5 Assemble base frames – height 150 mm for units in the sizes 50-150

Annex 6 Assemble base frames – height 250 mm for units in the sizes 10-40

Annex 7 Assemble base frames – height 250 mm for units in the sizes 50-150

Annex 8 Installation of steel roof in the sizes 10-150

Annex 9 Rotary exchanger – speed control and assembly of divided rotor

Annex 10 Heat pump unit – DVU-HP

Annex 11 Menu for internal controller in the heat pump unit

Annex 12 Connection of fan motor and set-up manual for Danfoss VLT FC101 frequency converter

Annex 13 Commissioning protocol – proposal (receipt for hand-over)

Printed on separate pages and delivered with every unit. Enclosed in separate cover

Annex 14 Report with data from the final functional test on the Systemair factory

Printed on separate pages and delivered with every unit. Enclosed in separate cover.

Annex 15 Short description of main components in control system

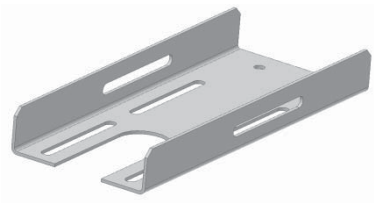
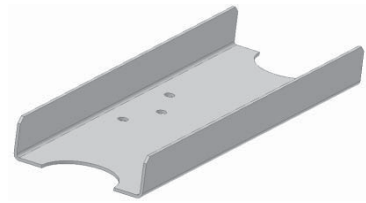
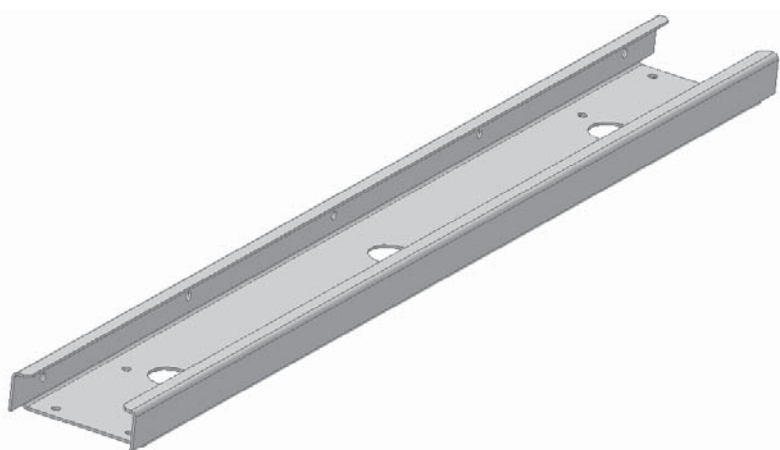
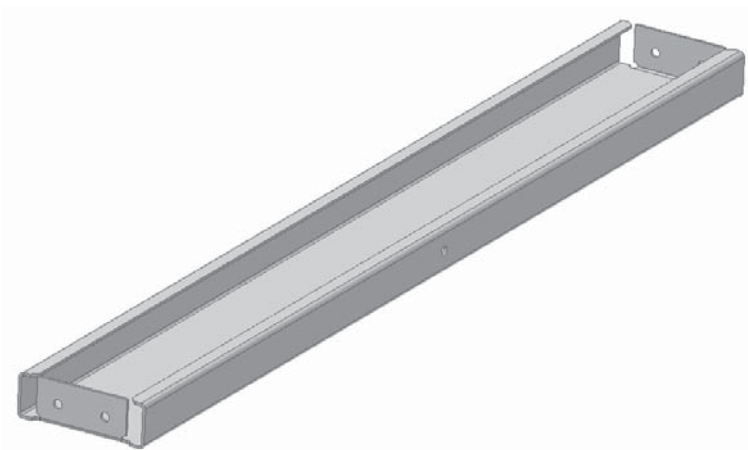
Annex 16 Wiring diagram

Annex 17 Operator's guide (how to use the Systemair control panel)

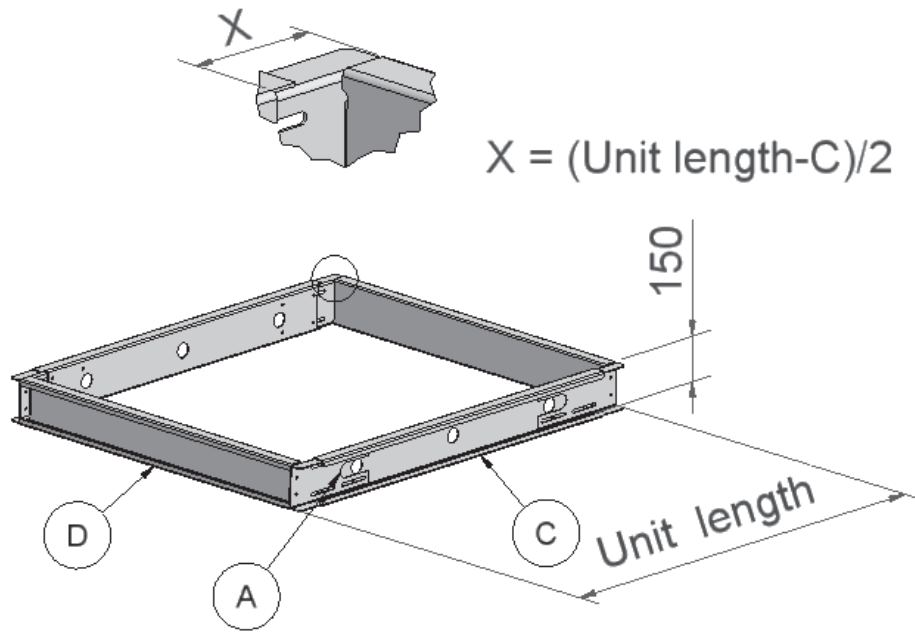
A separate manual on 12 pages delivered with every unit. This manual assists the everyday user/operator about how to control the unit by navigating the menus by the buttons and the display. Enclosed in separate cover.

Annex 4.
10-40

Assemble base frames – height 150 mm for units sizes

| | |
|--|---|
| <p>A = Corner</p>  | <p>B = Splice</p>  |
| <p>C = Length profile</p>  | |
| <p>D = Width profile</p>  | |

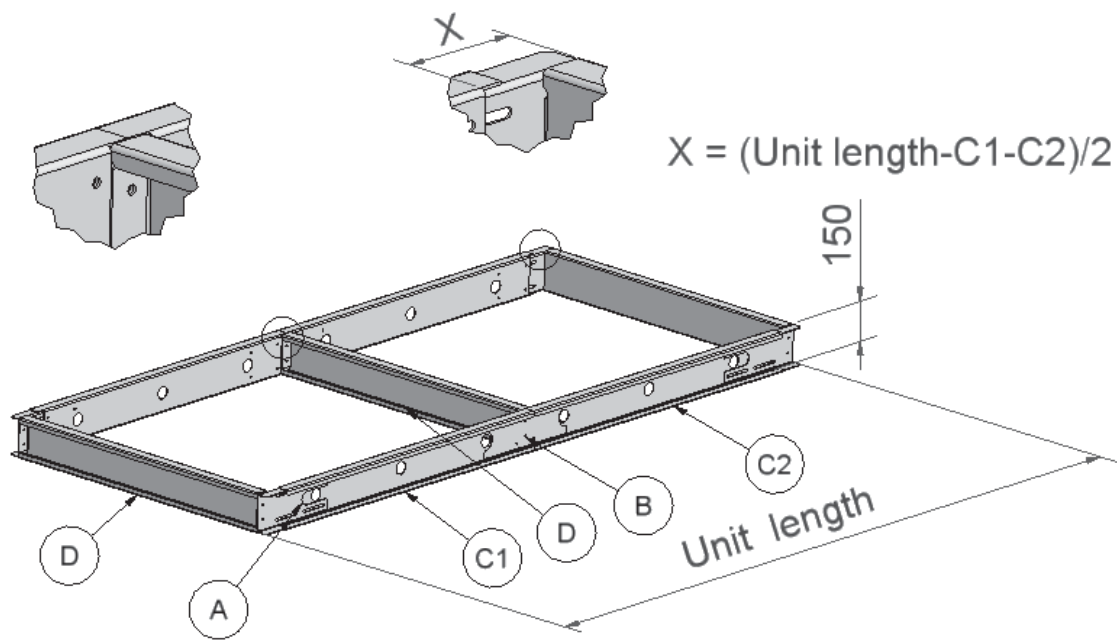
4.1 Base frame length 720 – 2420 [mm] Unit size 10-40



| Width profile type D | | |
|----------------------|----------|-------------|
| Unit size | Quantity | Length [mm] |
| DV-10 | 2 | 876 |
| DV-15 | 2 | 1026 |
| DV-20 | 2 | 1176 |
| DV-25 | 2 | 1326 |
| DV-30 | 2 | 1476 |
| DV-40 | 2 | 1626 |

| C | | A | |
|-------------------|----------|-------------|----------|
| Frame length [mm] | Quantity | Length [mm] | Quantity |
| 700-770 | 2 | 520 | 4 |
| 770-920 | 2 | 670 | 4 |
| 920-1070 | 2 | 820 | 4 |
| 1070-1220 | 2 | 970 | 4 |
| 1220-1370 | 2 | 1120 | 4 |
| 1370-1520 | 2 | 1270 | 4 |
| 1520-1670 | 2 | 1420 | 4 |
| 1670-1820 | 2 | 1570 | 4 |
| 1820-1970 | 2 | 1720 | 4 |
| 1970-2120 | 2 | 1870 | 4 |
| 2120-2270 | 2 | 2020 | 4 |
| 2270-2420 | 2 | 2170 | 4 |

4.2 Base frame length 2420 – 4590 [mm] Unit size 10-40

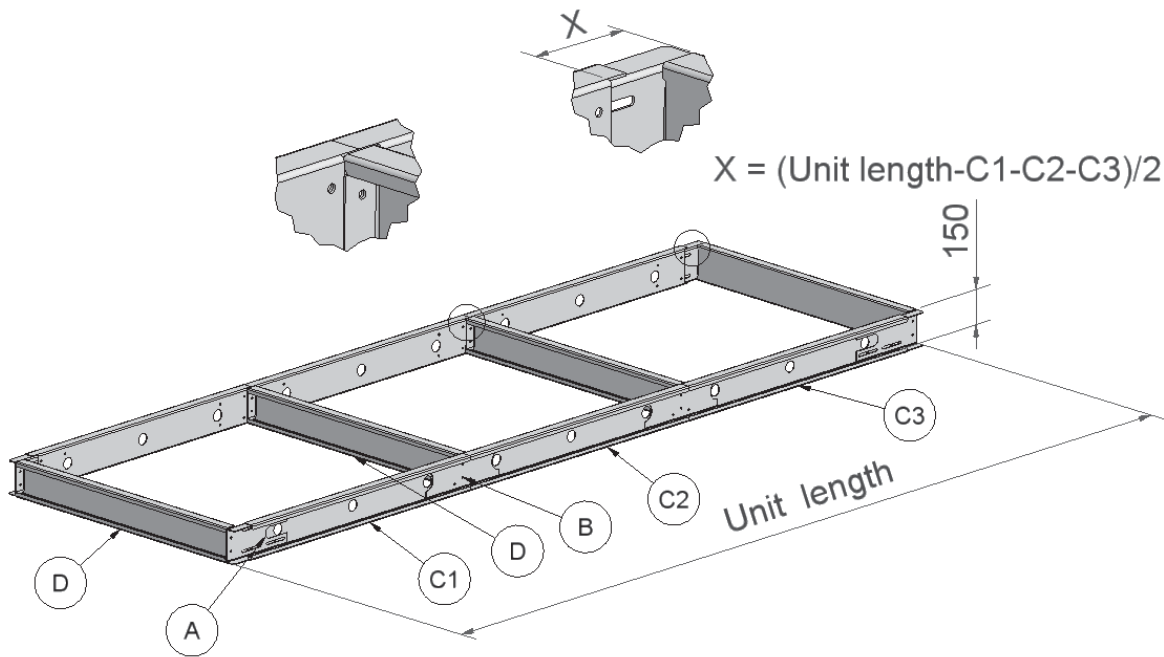


Width profile type D

| Unit size | Quantity | Length [mm] |
|-----------|----------|-------------|
| DV-10 | 3 | 876 |
| DV-15 | 3 | 1026 |
| DV-20 | 3 | 1176 |
| DV-25 | 3 | 1326 |
| DV-30 | 3 | 1476 |
| DV-40 | 3 | 1626 |

| C1 | | C2 | | A | B |
|-------------------|----------|-------------|----------|-------------|----------|
| Frame length [mm] | Quantity | Length [mm] | Quantity | Length [mm] | Quantity |
| 2420-2570 | 2 | 1120 | 2 | 1200 | 4 |
| 2570-2640 | 2 | 1270 | 2 | 1200 | 4 |
| 2640-2790 | 2 | 1270 | 2 | 1270 | 4 |
| 2790-2940 | 2 | 1270 | 2 | 1420 | 4 |
| 2940-3090 | 2 | 1420 | 2 | 1420 | 4 |
| 3090-3240 | 2 | 1420 | 2 | 1570 | 4 |
| 3240-3390 | 2 | 1570 | 2 | 1570 | 4 |
| 3390-3540 | 2 | 1570 | 2 | 1720 | 4 |
| 3540-3690 | 2 | 1720 | 2 | 1720 | 4 |
| 3690-3840 | 2 | 1720 | 2 | 1870 | 4 |
| 3840-3990 | 2 | 1870 | 2 | 1870 | 4 |
| 3990-4140 | 2 | 1870 | 2 | 2020 | 4 |
| 4140-4290 | 2 | 2020 | 2 | 2020 | 4 |
| 4290-4440 | 2 | 2020 | 2 | 2170 | 4 |
| 4440-4590 | 2 | 2170 | 2 | 2170 | 4 |

4.3 Base frame length 4590 – 6200 [mm] Unit size 10-40



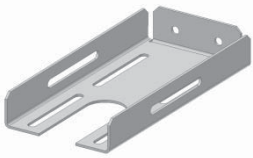

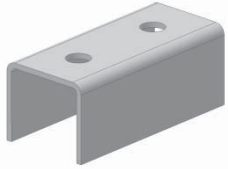
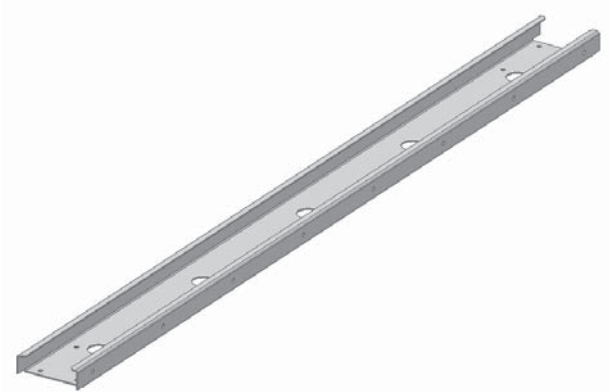
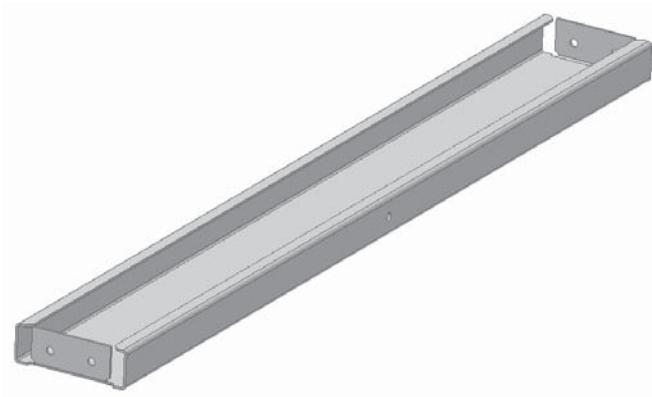
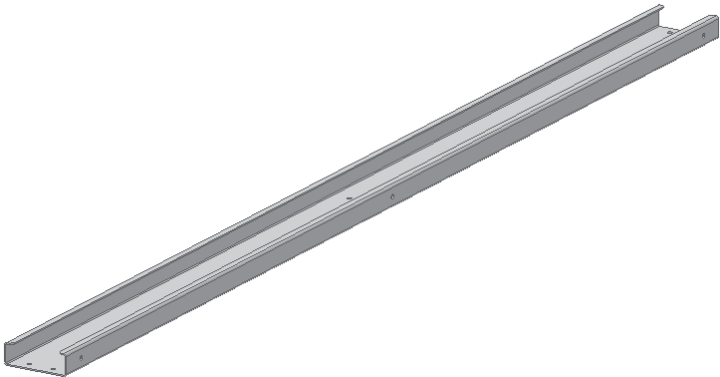
Width profile type D

| <i>Unit size</i> | <i>Quantity</i> | <i>Length [mm]</i> |
|------------------|-----------------|--------------------|
| DV-10 | 4 | 876 |
| DV-15 | 4 | 1026 |
| DV-20 | 4 | 1176 |
| DV-25 | 4 | 1326 |
| DV-30 | 4 | 1476 |
| DV-40 | 4 | 1626 |

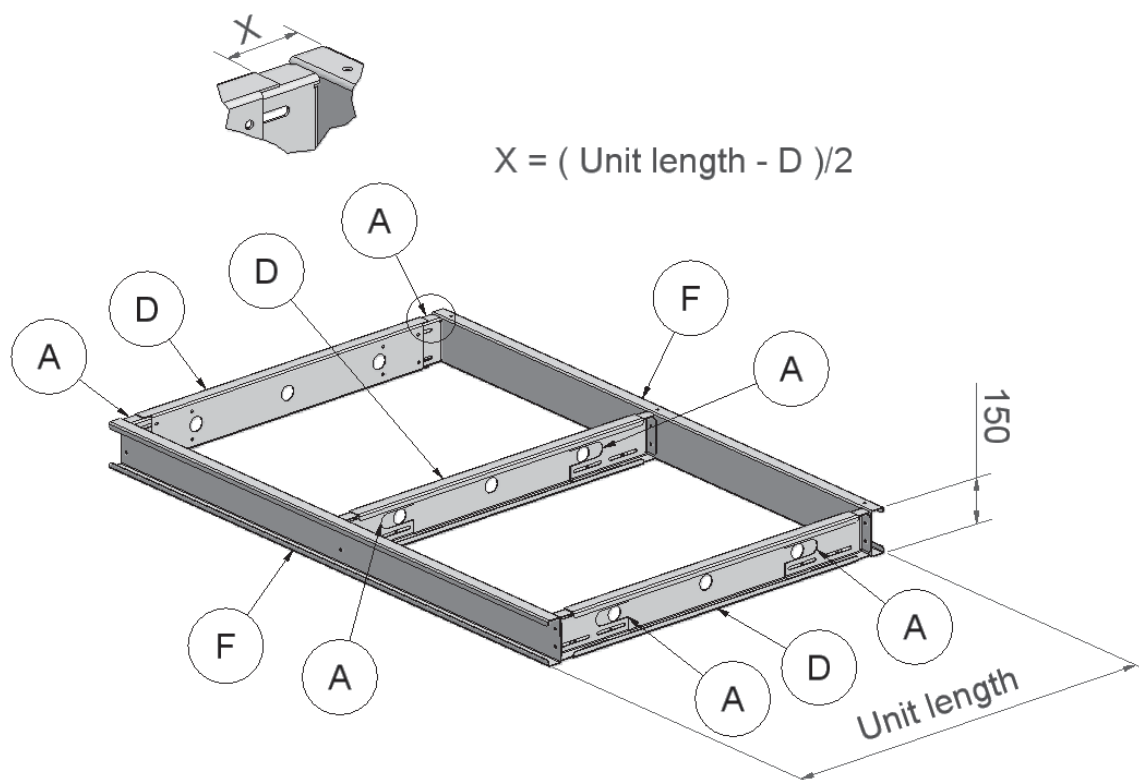
| C1 | | C2 | | C3 | | A | B |
|--------------------------|-----------------|--------------------|-----------------|--------------------|---------------|--------------------|----------------|
| <i>Frame length [mm]</i> | <i>Quantity</i> | <i>Length [mm]</i> | <i>Quantity</i> | <i>Length [mm]</i> | <i>Number</i> | <i>Length [mm]</i> | <i>Qty Qty</i> |
| 4590-4740 | 2 | 1420 | 2 | 1500 | 2 | 1570 | 4 4 |
| 4740-4890 | 2 | 1570 | 2 | 1570 | 2 | 1500 | 4 4 |
| 4890-5040 | 2 | 1720 | 2 | 1500 | 2 | 1570 | 4 4 |
| 5040-5110 | 2 | 1720 | 2 | 1720 | 2 | 1500 | 4 4 |
| 5110-5260 | 2 | 1720 | 2 | 1720 | 2 | 1570 | 4 4 |
| 5260-5410 | 2 | 1720 | 2 | 1720 | 2 | 1720 | 4 4 |
| 5410-5560 | 2 | 1870 | 2 | 1720 | 2 | 1720 | 4 4 |
| 5560-5710 | 2 | 1870 | 2 | 1870 | 2 | 1720 | 4 4 |
| 5710-5860 | 2 | 1870 | 2 | 1870 | 2 | 1870 | 4 4 |
| 5860-6010 | 2 | 2020 | 2 | 1870 | 2 | 1870 | 4 4 |
| 6010-6160 | 2 | 2020 | 2 | 2020 | 2 | 1870 | 4 4 |
| 6160-6200 | 2 | 2020 | 2 | 2020 | 2 | 2020 | 4 4 |

Annex 5.
50-150

Assemble base frames – height 150 mm for units sizes

| | | |
|---|--|--|
| <p>A = Corner</p>  | <p>B = Splice</p>  | <p>C = Spacer</p>  |
| <p>D = Length profile</p>  | | |
| <p>E = Spacer profile</p>  | | |
| <p>F = Width profile</p>  | | |

5.1 Base frame length 720 – 2420 [mm] Unit size 50-DV150

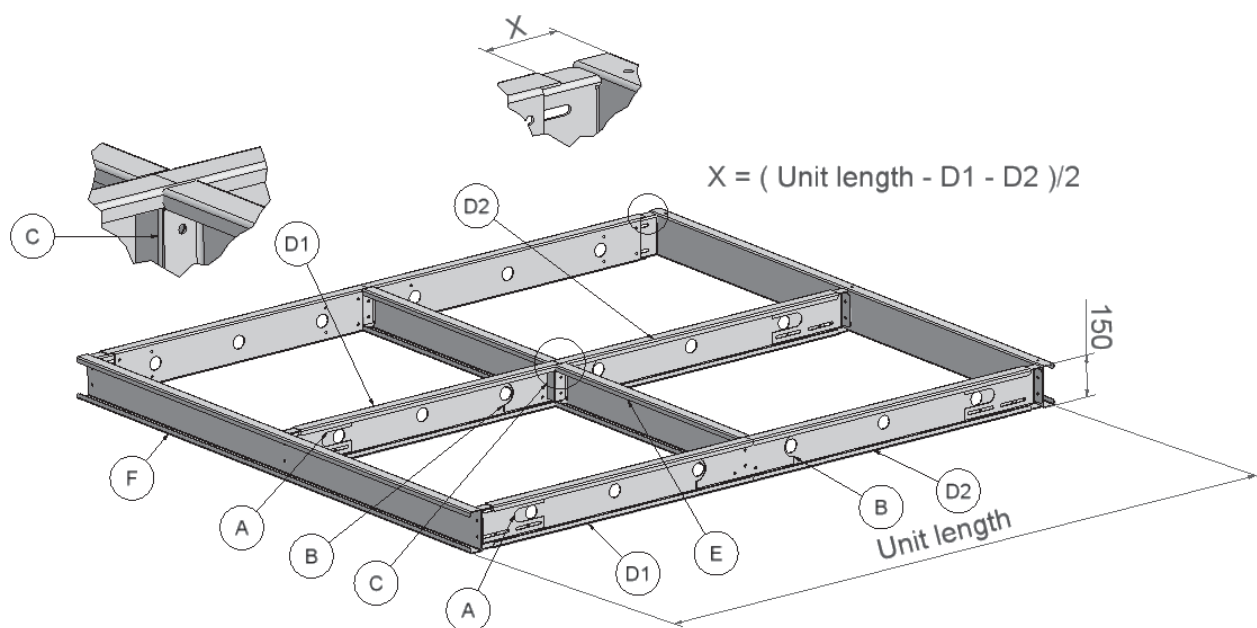


Width profile type F

| <i>Unit size</i> | <i>Quantity</i> | <i>Length [mm]</i> |
|------------------|-----------------|--------------------|
| DV-50 | 2 | 2020 |
| DV-60 | 2 | 2170 |
| DV-80 | 2 | 2170 |
| DV-100 | 2 | 2370 |
| DV-120 | 2 | 2590 |
| DV-150 | 2 | 2890 |

| <i>Frame length [mm]</i> | <i>Quantity</i> | D | A |
|--------------------------|-----------------|--------------------|-----------------|
| | | <i>Length [mm]</i> | <i>Quantity</i> |
| 700-770 | 3 | 520 | 6 |
| 770-920 | 3 | 670 | 6 |
| 920-1070 | 3 | 820 | 6 |
| 1070-1220 | 3 | 970 | 6 |
| 1220-1370 | 3 | 1120 | 6 |
| 1370-1520 | 3 | 1270 | 6 |
| 1520-1670 | 3 | 1420 | 6 |
| 1670-1820 | 3 | 1570 | 6 |
| 1820-1970 | 3 | 1720 | 6 |
| 1970-2120 | 3 | 1870 | 6 |
| 2120-2270 | 3 | 2020 | 6 |
| 2270-2420 | 3 | 2170 | 6 |

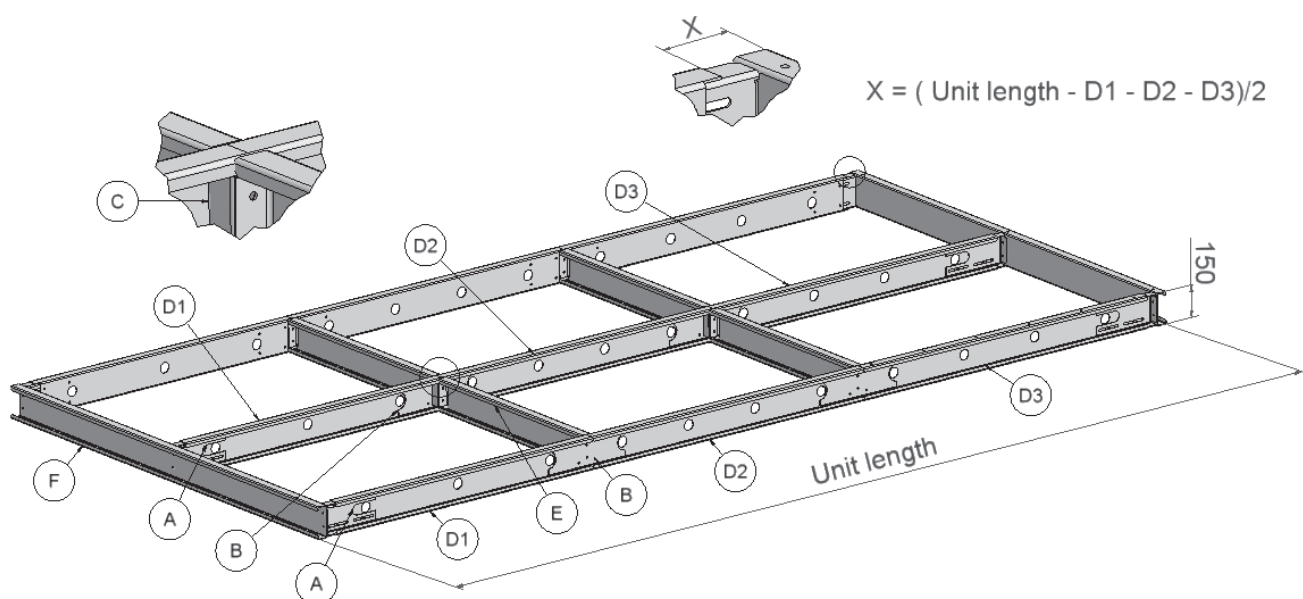
5.2 Base frame length 2420 – 4590 [mm] Unit size 50-150



| Width profile type F | | | Width profile type E | |
|----------------------|----------|-------------|----------------------|--|
| Unit size | Quantity | Length [mm] | Length [mm] | |
| DV-50 | 2 | 2020 | 940 | |
| DV-60 | 2 | 2170 | 1015 | |
| DV-80 | 2 | 2170 | 1015 | |
| DV-100 | 2 | 2370 | 1115 | |
| DV-120 | 2 | 2590 | 1225 | |
| DV-150 | 2 | 2890 | 1375 | |

| | | D1 | | D2 | | A | B | C | E |
|-------------------|----------|-------------|----------|-------------|----------|----------|----------|----------|----------|
| Frame length [mm] | Quantity | Length [mm] | Quantity | Length [mm] | Quantity | Quantity | Quantity | Quantity | Quantity |
| 2420-2570 | 3 | 1120 | 3 | 1200 | 6 | 3 | 1 | 2 | |
| 2570-2640 | 3 | 1270 | 3 | 1200 | 6 | 3 | 1 | 2 | |
| 2640-2790 | 3 | 1270 | 3 | 1270 | 6 | 3 | 1 | 2 | |
| 2790-2940 | 3 | 1270 | 3 | 1420 | 6 | 3 | 1 | 2 | |
| 2940-3090 | 3 | 1420 | 3 | 1420 | 6 | 3 | 1 | 2 | |
| 3090-3240 | 3 | 1420 | 3 | 1570 | 6 | 3 | 1 | 2 | |
| 3240-3390 | 3 | 1570 | 3 | 1570 | 6 | 3 | 1 | 2 | |
| 3390-3540 | 3 | 1570 | 3 | 1720 | 6 | 3 | 1 | 2 | |
| 3540-3690 | 3 | 1720 | 3 | 1720 | 6 | 3 | 1 | 2 | |
| 3690-3840 | 3 | 1720 | 3 | 1870 | 6 | 3 | 1 | 2 | |
| 3840-3990 | 3 | 1870 | 3 | 1870 | 6 | 3 | 1 | 2 | |
| 3990-4140 | 3 | 1870 | 3 | 2020 | 6 | 3 | 1 | 2 | |
| 4140-4290 | 3 | 2020 | 3 | 2020 | 6 | 3 | 1 | 2 | |
| 4290-4440 | 3 | 2020 | 3 | 2170 | 6 | 3 | 1 | 2 | |
| 4440-4590 | 3 | 2170 | 3 | 2170 | 6 | 3 | 1 | 2 | |

5.3 Base frame length 4590 – 6200 [mm] Unit size 50-150

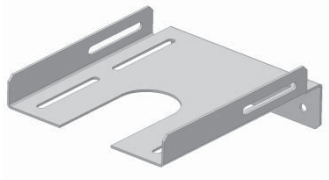
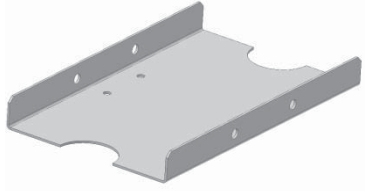
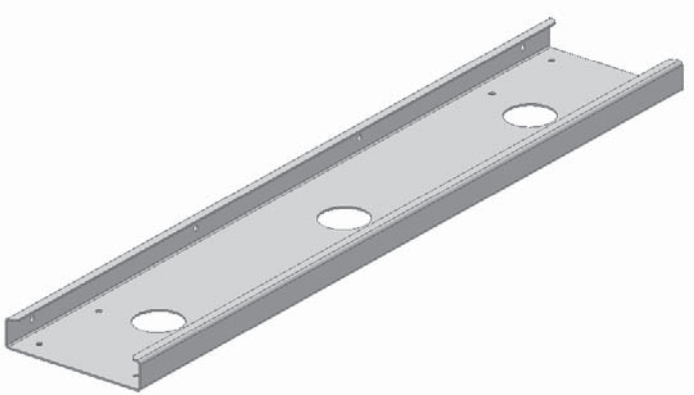
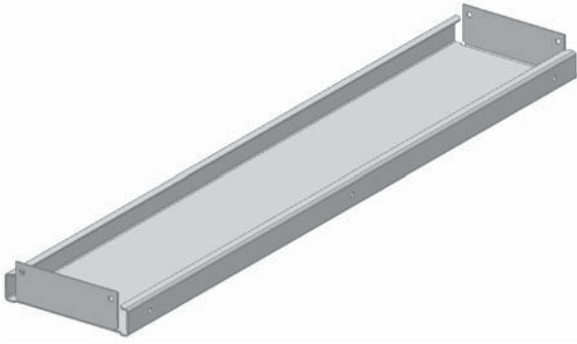
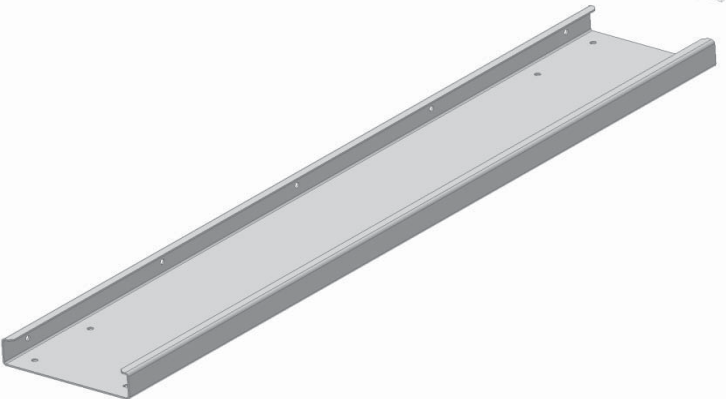


| Width profile type F | | | Width profile type E |
|----------------------|----------|-------------|----------------------|
| Unit size | Quantity | Length [mm] | Length [mm] |
| DV-50 | 2 | 2020 | 940 |
| DV-60 | 2 | 2170 | 1015 |
| DV-80 | 2 | 2170 | 1015 |
| DV-100 | 2 | 2370 | 1115 |
| DV-120 | 2 | 2590 | 1225 |
| DV-150 | 2 | 2890 | 1375 |

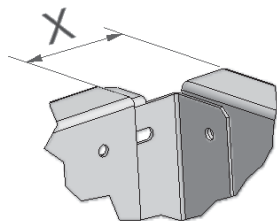
| D1 | | | D2 | | D3 | | A | B | C | E |
|-------------------|-----|-------------|-----|-------------|-----|-------------|-----|------|-----|-----|
| Frame length [mm] | Qty | Length [mm] | Qty | Length [mm] | Qty | Length [mm] | Qty | Qtyl | Qty | Qty |
| 4590-4740 | 3 | 1420 | 3 | 1500 | 3 | 1570 | 6 | 6 | 2 | 4 |
| 4740-4890 | 3 | 1570 | 3 | 1570 | 3 | 1500 | 6 | 6 | 2 | 4 |
| 4890-5040 | 3 | 1720 | 3 | 1500 | 3 | 1570 | 6 | 6 | 2 | 4 |
| 5040-5110 | 3 | 1720 | 3 | 1720 | 3 | 1500 | 6 | 6 | 2 | 4 |
| 5110-5260 | 3 | 1720 | 3 | 1720 | 3 | 1570 | 6 | 6 | 2 | 4 |
| 5260-5410 | 3 | 1720 | 3 | 1720 | 3 | 1720 | 6 | 6 | 2 | 4 |
| 5410-5560 | 3 | 1870 | 3 | 1720 | 3 | 1720 | 6 | 6 | 2 | 4 |
| 5560-5710 | 3 | 1870 | 3 | 1870 | 3 | 1720 | 6 | 6 | 2 | 4 |
| 5710-5860 | 3 | 1870 | 3 | 1870 | 3 | 1870 | 6 | 6 | 2 | 4 |
| 5860-6010 | 3 | 2020 | 3 | 1870 | 3 | 1870 | 6 | 6 | 2 | 4 |
| 6010-6160 | 3 | 2020 | 3 | 2020 | 3 | 1870 | 6 | 6 | 2 | 4 |
| 6160-6200 | 3 | 2020 | 3 | 2020 | 3 | 2020 | 6 | 6 | 2 | 4 |

Annex 6.
10-40

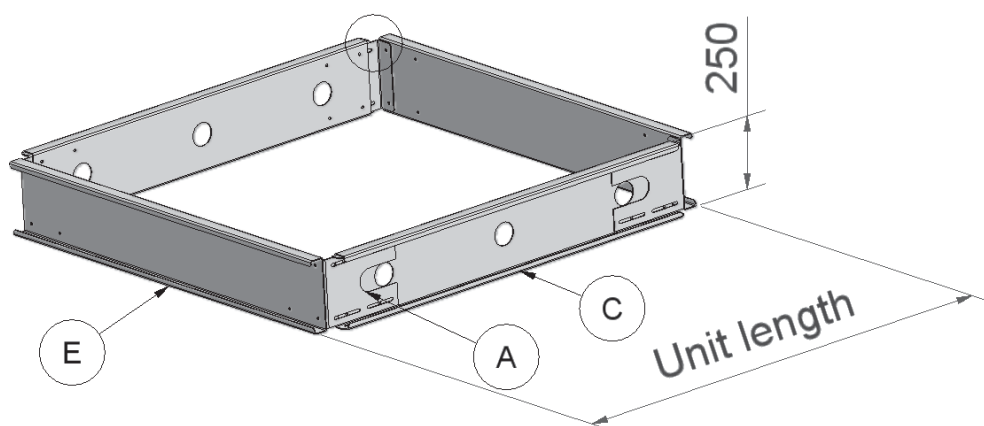
Assemble base frames – height 250 mm for units sizes

| | |
|---|---|
| <p>A = Corner</p>  | <p>B = Splice</p>  |
| <p>C = Length profile</p>  | |
| <p>D = Spacer profile</p>  | |
| <p>E = Width profile</p>  | |

6.1 Base frame length 720 – 2420 [mm] Unit size 10-40



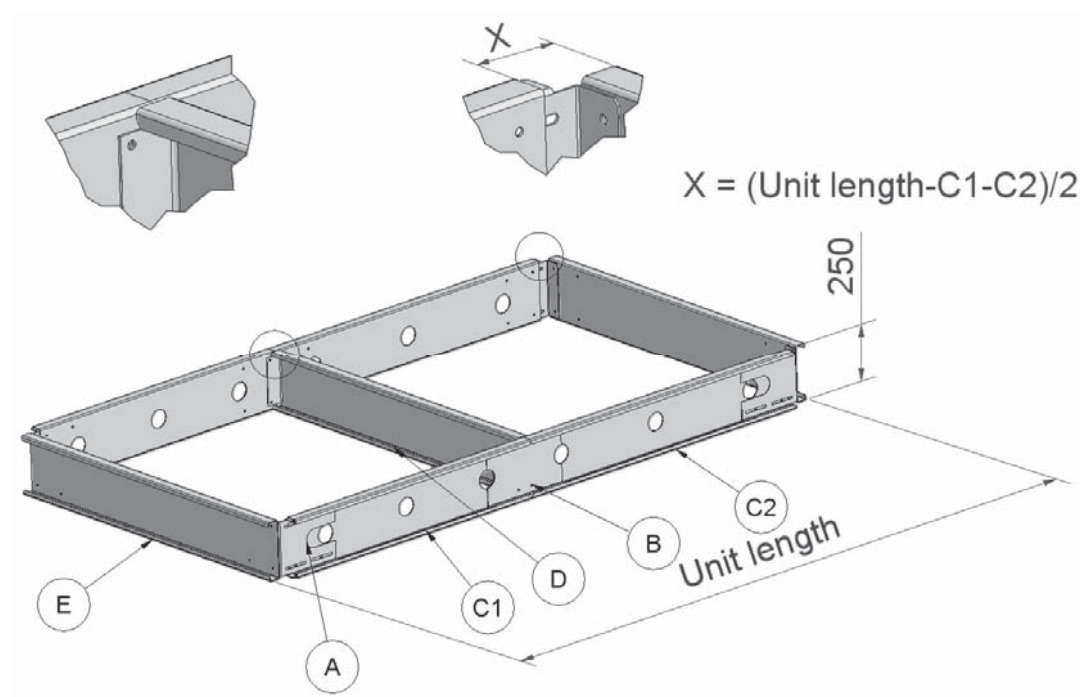
$$X = (\text{Unit length} - C) / 2$$



| Width profile type E | | |
|----------------------|----------|-------------|
| Unit size | Quantity | Length [mm] |
| DV-10 | 2 | 870 |
| DV-15 | 2 | 1020 |
| DV-20 | 2 | 1170 |
| DV-25 | 2 | 1320 |
| DV-30 | 2 | 1470 |
| DV-40 | 2 | 1620 |

| Frame length [mm] | Quantity | C | A |
|-------------------|----------|-------------|----------|
| | | Length [mm] | Quantity |
| 700-770 | 2 | 520 | 4 |
| 770-920 | 2 | 670 | 4 |
| 920-1070 | 2 | 820 | 4 |
| 1070-1220 | 2 | 970 | 4 |
| 1220-1370 | 2 | 1120 | 4 |
| 1370-1520 | 2 | 1270 | 4 |
| 1520-1670 | 2 | 1420 | 4 |
| 1670-1820 | 2 | 1570 | 4 |
| 1820-1970 | 2 | 1720 | 4 |
| 1970-2120 | 2 | 1870 | 4 |
| 2120-2270 | 2 | 2020 | 4 |
| 2270-2420 | 2 | 2170 | 4 |

6.2 Base frame length 2420 – 4590 [mm] Unit size 10-40



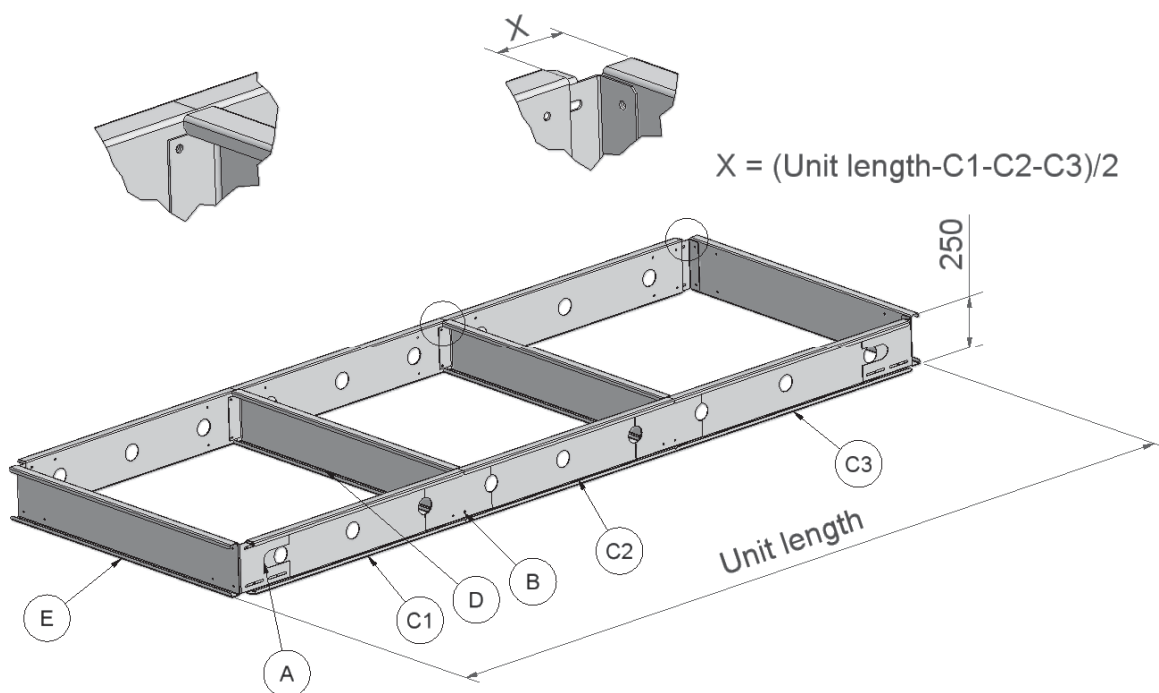
Width profile type E

Spacer profile type
D

| Unit size | Quantity | Length [mm] | Length [mm] |
|-----------|----------|-------------|-------------|
| DV-10 | 2 | 870 | 870 |
| DV-15 | 2 | 1020 | 1020 |
| DV-20 | 2 | 1170 | 1170 |
| DV-25 | 2 | 1320 | 1320 |
| DV-30 | 2 | 1470 | 1470 |
| DV-40 | 2 | 1620 | 1620 |

| | | C1 | | C2 | | A | B | D |
|-------------------|----------|-------------|----------|-------------|-----|-----|-----|---|
| Frame length [mm] | Quantity | Length [mm] | Quantity | Length [mm] | Qty | Qty | Qty | |
| 2420-2570 | 2 | 1120 | 2 | 1200 | 4 | 2 | 1 | |
| 2570-2640 | 2 | 1270 | 2 | 1200 | 4 | 2 | 1 | |
| 2640-2790 | 2 | 1270 | 2 | 1270 | 4 | 2 | 1 | |
| 2790-2940 | 2 | 1270 | 2 | 1420 | 4 | 2 | 1 | |
| 2940-3090 | 2 | 1420 | 2 | 1420 | 4 | 2 | 1 | |
| 3090-3240 | 2 | 1420 | 2 | 1570 | 4 | 2 | 1 | |
| 3240-3390 | 2 | 1570 | 2 | 1570 | 4 | 2 | 1 | |
| 3390-3540 | 2 | 1570 | 2 | 1720 | 4 | 2 | 1 | |
| 3540-3690 | 2 | 1720 | 2 | 1720 | 4 | 2 | 1 | |
| 3690-3840 | 2 | 1720 | 2 | 1870 | 4 | 2 | 1 | |
| 3840-3990 | 2 | 1870 | 2 | 1870 | 4 | 2 | 1 | |
| 3990-4140 | 2 | 1870 | 2 | 2020 | 4 | 2 | 1 | |
| 4140-4290 | 2 | 2020 | 2 | 2020 | 4 | 2 | 1 | |
| 4290-4440 | 2 | 2020 | 2 | 2170 | 4 | 2 | 1 | |
| 4440-4590 | 2 | 2170 | 2 | 2170 | 4 | 2 | 1 | |

6.3 Base frame length 4590 – 6200 [mm] Unit size 10-40

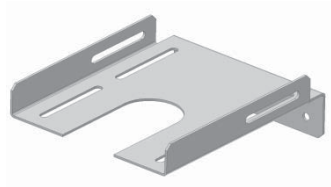
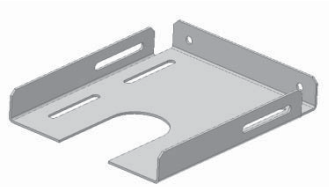
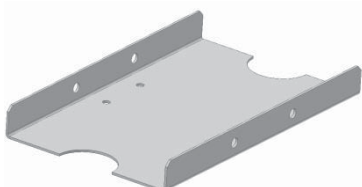
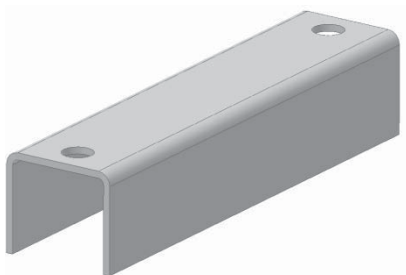
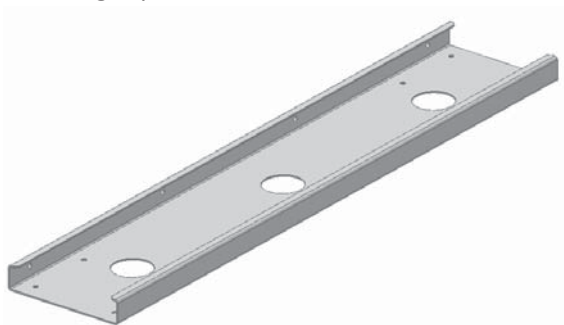
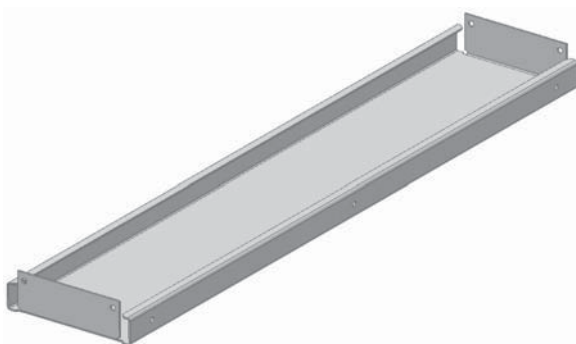
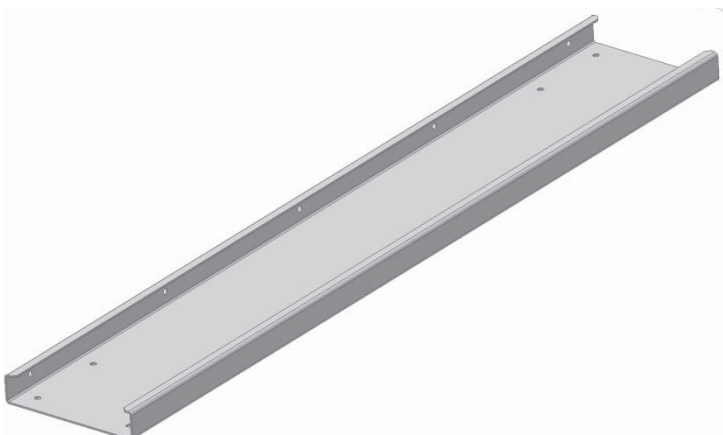


| Width profile type E | | | Spacer profile type D |
|----------------------|----------|-------------|-----------------------|
| Unit size | Quantity | Length [mm] | Length [mm] |
| DV-10 | 2 | 870 | 870 |
| DV-15 | 2 | 1020 | 1020 |
| DV-20 | 2 | 1170 | 1170 |
| DV-25 | 2 | 1320 | 1320 |
| DV-30 | 2 | 1470 | 1470 |
| DV-40 | 2 | 1620 | 1620 |

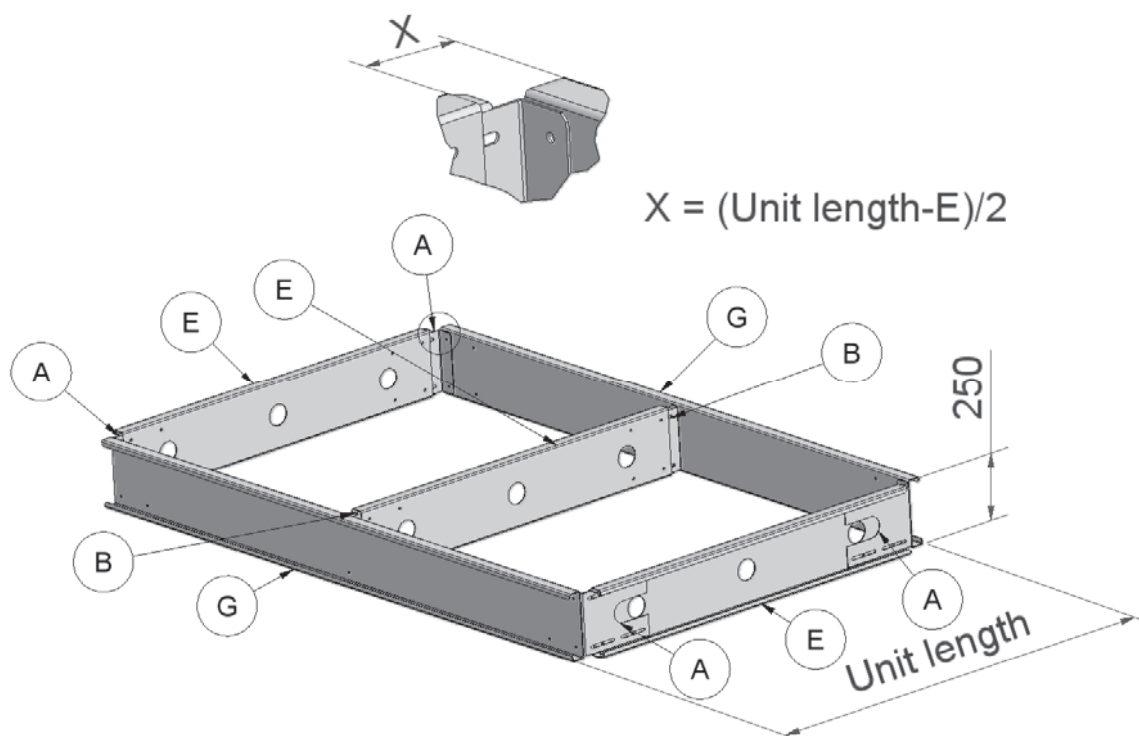
| | | C1 | | C2 | | C3 | | A | B | D |
|-------------------|-----|-------------|-----|-------------|-----|-------------|-----|-----|-----|---|
| Frame length [mm] | Qty | Length [mm] | Qty | Length [mm] | Qty | Length [mm] | Qty | Qty | Qty | |
| 4590-4740 | 2 | 1420 | 2 | 1500 | 2 | 1570 | 4 | 4 | 2 | |
| 4740-4890 | 2 | 1570 | 2 | 1570 | 2 | 1500 | 4 | 4 | 2 | |
| 4890-5040 | 2 | 1720 | 2 | 1500 | 2 | 1570 | 4 | 4 | 2 | |
| 5040-5110 | 2 | 1720 | 2 | 1720 | 2 | 1500 | 4 | 4 | 2 | |
| 5110-5260 | 2 | 1720 | 2 | 1720 | 2 | 1570 | 4 | 4 | 2 | |
| 5260-5410 | 2 | 1720 | 2 | 1720 | 2 | 1720 | 4 | 4 | 2 | |
| 5410-5560 | 2 | 1870 | 2 | 1720 | 2 | 1720 | 4 | 4 | 2 | |
| 5560-5710 | 2 | 1870 | 2 | 1870 | 2 | 1720 | 4 | 4 | 2 | |
| 5710-5860 | 2 | 1870 | 2 | 1870 | 2 | 1870 | 4 | 4 | 2 | |
| 5860-6010 | 2 | 2020 | 2 | 1870 | 2 | 1870 | 4 | 4 | 2 | |
| 6010-6160 | 2 | 2020 | 2 | 2020 | 2 | 1870 | 4 | 4 | 2 | |
| 6160-6200 | 2 | 2020 | 2 | 2020 | 2 | 2020 | 4 | 4 | 2 | |

Annex 7.
50-150

Assemble base frames – height 250 mm for units sizes

| | | |
|---|---|--|
| A = Corner  | B = Splice  | C = Splice  |
| D = Spacer  | E = Length profile  | |
| F = Spacer profile  | | |
| G = Width profile  | | |

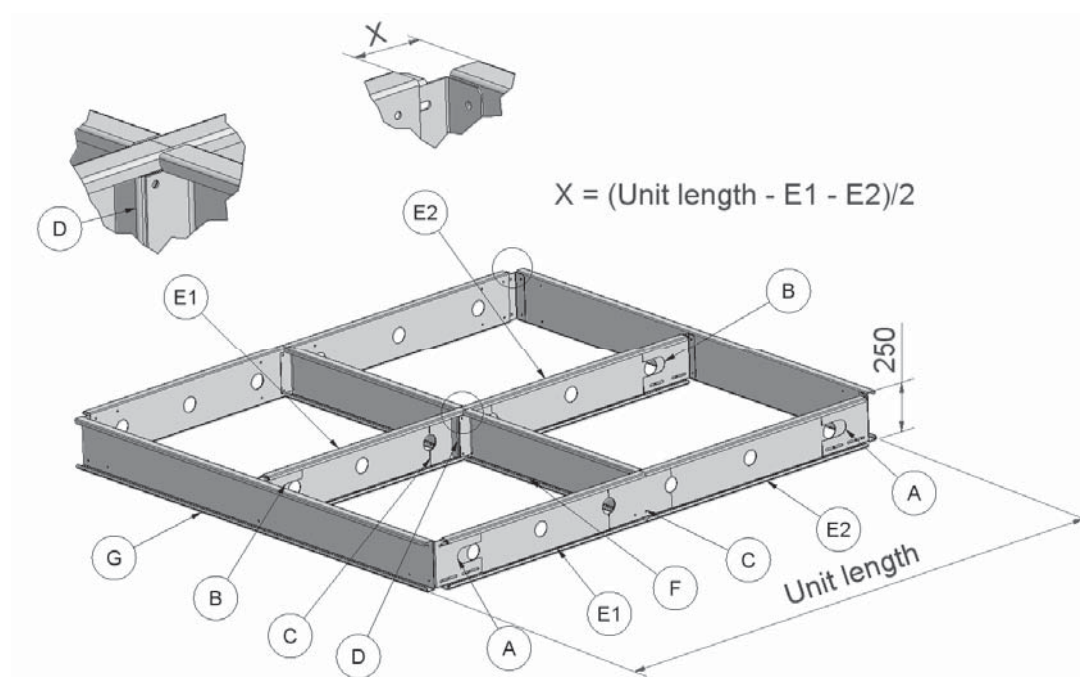
7.1 Base frame length 720 – 2420 [mm] Unit size 50-150



| Width profile type G | | |
|----------------------|----------|-------------|
| Unit size | Quantity | Length [mm] |
| DV-50 | 2 | 1920 |
| DV-60 | 2 | 2070 |
| DV-80 | 2 | 2070 |
| DV-100 | 2 | 2270 |
| DV-120 | 2 | 2490 |
| DV-150 | 2 | 2790 |

| Frame length [mm] | Quantity | E | A | B |
|-------------------|----------|-------------|----------|----------|
| | | Length [mm] | Quantity | Quantity |
| 700-770 | 3 | 520 | 4 | 2 |
| 770-920 | 3 | 670 | 4 | 2 |
| 920-1070 | 3 | 820 | 4 | 2 |
| 1070-1220 | 3 | 970 | 4 | 2 |
| 1220-1370 | 3 | 1120 | 4 | 2 |
| 1370-1520 | 3 | 1270 | 4 | 2 |
| 1520-1670 | 3 | 1420 | 4 | 2 |
| 1670-1820 | 3 | 1570 | 4 | 2 |
| 1820-1970 | 3 | 1720 | 4 | 2 |
| 1970-2120 | 3 | 1870 | 4 | 2 |
| 2120-2270 | 3 | 2020 | 4 | 2 |
| 2270-2420 | 3 | 2170 | 4 | 2 |

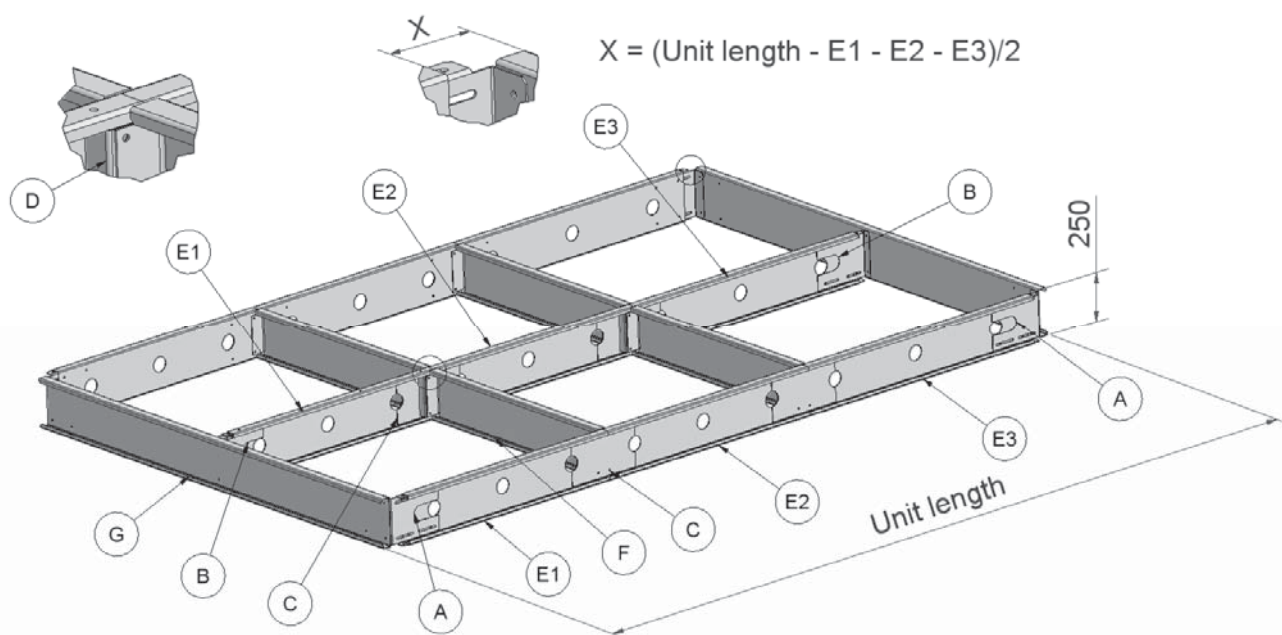
7.2 Base frame length 2420 – 4590 [mm] Unit size 50-150



| Width profile type G | | | Spacer profile type F |
|----------------------|----------|-------------|-----------------------|
| Unit size | Quantity | Length [mm] | Length [mm] |
| DV-50 | 2 | 1920 | 935 |
| DV-60 | 2 | 2070 | 1010 |
| DV-80 | 2 | 2070 | 1010 |
| DV-100 | 2 | 2270 | 1110 |
| DV-120 | 2 | 2490 | 1220 |
| DV-150 | 2 | 2790 | 1370 |

| | | C1 | | C2 | | A | B | C | D | F |
|-------------------|-----|-------------|-----|-------------|-----|-----|-----|-----|-----|-----|
| Frame length [mm] | Qty | Length [mm] | Qty | Length [mm] | Qty | Qty | Qty | Qty | Qty | Qty |
| 2420-2570 | 3 | 1120 | 3 | 1200 | 4 | 2 | 3 | 1 | 2 | |
| 2570-2640 | 3 | 1270 | 3 | 1200 | 4 | 2 | 3 | 1 | 2 | |
| 2640-2790 | 3 | 1270 | 3 | 1270 | 4 | 2 | 3 | 1 | 2 | |
| 2790-2940 | 3 | 1270 | 3 | 1420 | 4 | 2 | 3 | 1 | 2 | |
| 2940-3090 | 3 | 1420 | 3 | 1420 | 4 | 2 | 3 | 1 | 2 | |
| 3090-3240 | 3 | 1420 | 3 | 1570 | 4 | 2 | 3 | 1 | 2 | |
| 3240-3390 | 3 | 1570 | 3 | 1570 | 4 | 2 | 3 | 1 | 2 | |
| 3390-3540 | 3 | 1570 | 3 | 1720 | 4 | 2 | 3 | 1 | 2 | |
| 3540-3690 | 3 | 1720 | 3 | 1720 | 4 | 2 | 3 | 1 | 2 | |
| 3690-3840 | 3 | 1720 | 3 | 1870 | 4 | 2 | 3 | 1 | 2 | |
| 3840-3990 | 3 | 1870 | 3 | 1870 | 4 | 2 | 3 | 1 | 2 | |
| 3990-4140 | 3 | 1870 | 3 | 2020 | 4 | 2 | 3 | 1 | 2 | |
| 4140-4290 | 3 | 2020 | 3 | 2020 | 4 | 2 | 3 | 1 | 2 | |
| 4290-4440 | 3 | 2020 | 3 | 2170 | 4 | 2 | 3 | 1 | 2 | |
| 4440-4590 | 3 | 2170 | 3 | 2170 | 4 | 2 | 3 | 1 | 2 | |

7.3 Base frame length 4590 – 6200 [mm] Unit size 50-150



| Width profile type G | | | Spacer profile type F |
|----------------------|----------|-------------|-----------------------|
| Unit size | Quantity | Length [mm] | Length [mm] |
| DV-50 | 2 | 1920 | 935 |
| DV-60 | 2 | 2070 | 1010 |
| DV-80 | 2 | 2070 | 1010 |
| DV-100 | 2 | 2270 | 1110 |
| DV-120 | 2 | 2490 | 1220 |
| DV-150 | 2 | 2790 | 1370 |

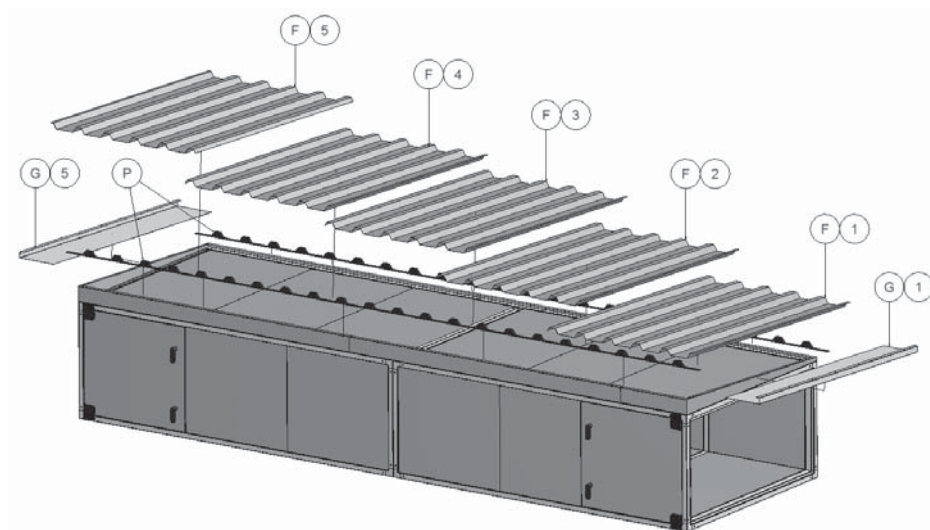
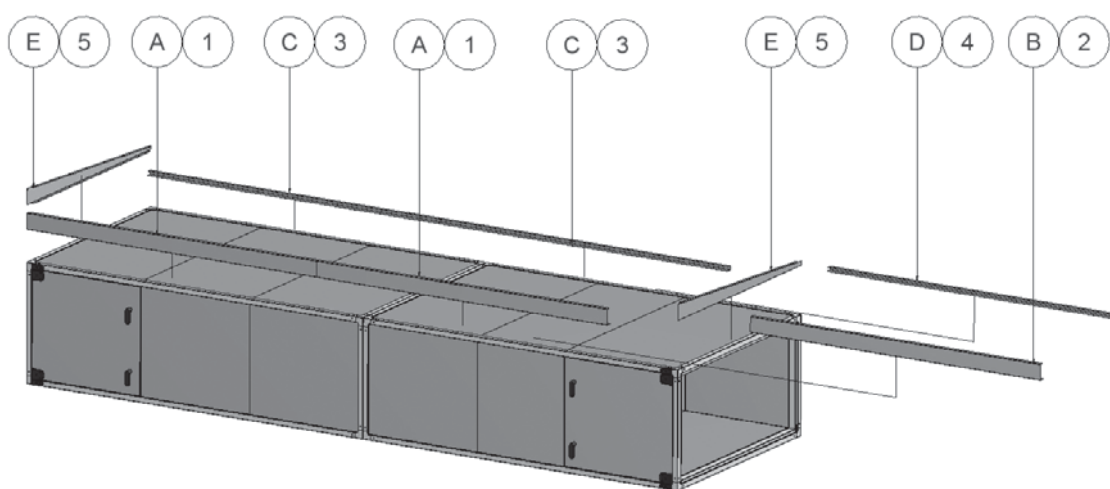
| | | E1 | | E2 | | E3 | | A | B | C | D | F |
|-------------------|-----|-------------|-----|-------------|-----|-------------|-----|-----|-----|-----|-----|-----|
| Frame length [mm] | Qty | Length [mm] | Qty | Length [mm] | Qty | Length [mm] | Qty | Qty | Qty | Qty | Qty | Qty |
| 4590-4740 | 3 | 1420 | 3 | 1500 | 3 | 1570 | 4 | 2 | 6 | 2 | 4 | 4 |
| 4740-4890 | 3 | 1570 | 3 | 1570 | 3 | 1500 | 4 | 2 | 6 | 2 | 4 | 4 |
| 4890-5040 | 3 | 1720 | 3 | 1500 | 3 | 1570 | 4 | 2 | 6 | 2 | 4 | 4 |
| 5040-5110 | 3 | 1720 | 3 | 1720 | 3 | 1500 | 4 | 2 | 6 | 2 | 4 | 4 |
| 5110-5260 | 3 | 1720 | 3 | 1720 | 3 | 1570 | 4 | 2 | 6 | 2 | 4 | 4 |
| 5260-5410 | 3 | 1720 | 3 | 1720 | 3 | 1720 | 4 | 2 | 6 | 2 | 4 | 4 |
| 5410-5560 | 3 | 1870 | 3 | 1720 | 3 | 1720 | 4 | 2 | 6 | 2 | 4 | 4 |
| 5560-5710 | 3 | 1870 | 3 | 1870 | 3 | 1720 | 4 | 2 | 6 | 2 | 4 | 4 |
| 5710-5860 | 3 | 1870 | 3 | 1870 | 3 | 1870 | 4 | 2 | 6 | 2 | 4 | 4 |
| 5860-6010 | 3 | 2020 | 3 | 1870 | 3 | 1870 | 4 | 2 | 6 | 2 | 4 | 4 |
| 6010-6160 | 3 | 2020 | 3 | 2020 | 3 | 1870 | 4 | 2 | 6 | 2 | 4 | 4 |
| 6160-6200 | 3 | 2020 | 3 | 2020 | 3 | 2020 | 4 | 2 | 6 | 2 | 4 | 4 |

Annex 8.

Installation of steel roof in the sizes 10-150

8.1 Overview

- Mount rails A1, B2, C3, D4, E5 on the unit for support of trapezoidal roof plates (mount also rails Y and Z on units of the size 30 and on units that are larger than size 30 longitudinally at the centre-line of the units).
- Place foam bands – P – on the horizontal rails A1, B2, C3 and D4 for support of roof plates.
- Calculate overhang of the roof at both ends of the unit and mount roof overhang profile – G1 on the first trapezoidal roof plate – F1 before the roof plate is mounted.
- Place and mount roof plates F1, F2, F3 and so on.
- Remember foam bands on the side laps between roof plates to prevent rainwater from passing through.
- Place roof overhang profile – G5 at the other end of the unit before the last roof plate is mounted.
- Mount sides and corners on the roof.
- Apply sealing where plates are joined to ensure water resistance - even in stormy weather.



8.2 Mount rails. Units of size 10, 15, 20, and 25

Squeeze sealant in sufficient quantity between the underside of the rails A1, B2, C3, D4, E5 and the horizontal top side of the unit before the rails are mounted. This means that the rails are standing on

sealant to achieve the tightest connection between rails and unit to prevent rainwater from passing under the rails and into the unit. Mount the rails A1 and B2 on the front side (the side with the inspection doors) – use the simple self-drilling screws without the sealing washer – see the illustration of the screw below.



Note: Rail B2 fits into the rail A1, and this offers the advantage that the rail B2 can be slid inside the rail A1 to adjust the length of rail B2 accurately to the length of the unit. In this way it is not necessary to spend time and effort cutting the rail B2.

Mount the lower rails C3 and D4 on the back side of the unit.

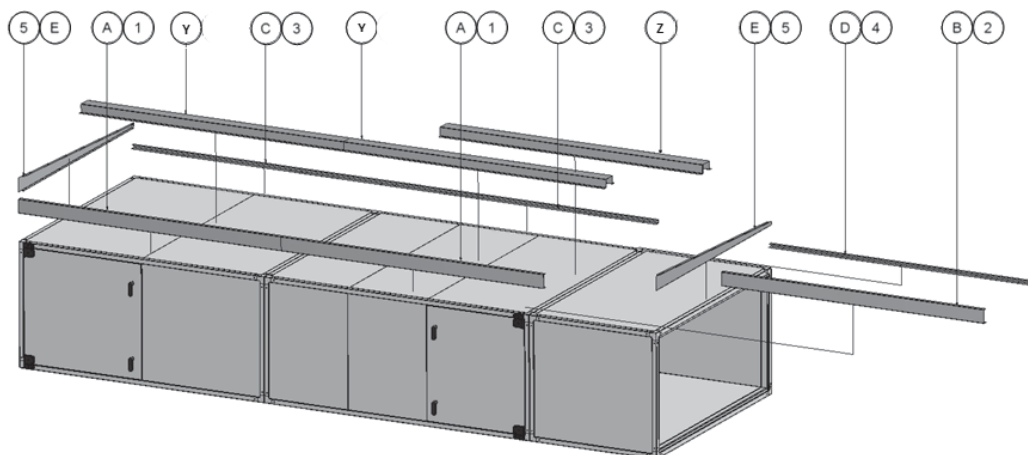
Note: Rail D4 fits into the rail C3, and this offers the advantage that the rail D4 can be slid inside the rail C3 to adjust the length of rail D4 accurately to the length of the unit. In this way it is not necessary to spend time and effort on cutting the rail D4.

Mount vertical rail – E5 - with the roof slope at each end of the unit

It is important to place a screw in each hole – even though the number of holes for screws seems to be very large, a screw in each hole is necessary as the stress on the roof during stormy weather is extremely high.

8.3 Mount rails. Units of size 30 and units larger than size 30.

On units of size 30 and on units that are larger than size 30, rails A1, B2, C3, D4, E5 must be mounted on the unit for support of trapezoidal roof plates, but also rails Y and Z must be mounted longitudinally at the centre-line of the units to hold the trapezoidal roof plates.



Squeeze sealant in sufficient quantity between the underside of the rails A1, B2, C3, D4, E5 and the horizontal top side of the unit before the rails are mounted. This means that the rails are standing on sealant to achieve the tightest connection between rails and unit to prevent rainwater from passing under the rails and into the unit. Mount the rails A1 and B2 on the front side (the side with the inspection doors) – use the simple self drilling screws without the sealing washer – see the illustration of the screw below.



Note: Rail B2 fits into the rail A1, and this offers the advantage that the rail B2 can be slid inside the rail A1 to adjust the length of rail B2 accurately to the length of the unit. In this way it is not necessary to spend time and effort cutting the rail B2.

Mount the lower rails C3 and D4 on the back side of the unit.

Note: Rail D4 fits into the rail C3, and this offers the advantage that the rail D4 can be slid inside the rail C3 to adjust the length of rail D4 accurately to the length of the unit. In this way it is not necessary to spend time and effort cutting the rail D4.

Mount vertical rail – E5 - with the roof slope at each end of the unit.

Mount the rails Y and Z on the unit with the centre-line of the rails exactly over the centre-line of the unit. It is longitudinal on the middle of the units to hold the trapezoidal roof plates.

Notice, that rail Z fits over the lower rail Y, and this offers the advantage that the rail Z can be slid on the rail Y to adjust the length of rail Z accurately to the length of the unit. In this way it is not necessary to spent time and effort on cutting the rail Z.

It is important to place a screw in each hole – even though the number of holes for screws seems to be very large, a screw in each hole is necessary as the stress on the roof during stormy weather is extremely high.

8.4 Roof overhang along the long sides of the unit

The roof plates are longer than the width of the unit to ensure sufficient overhang along the sides of the unit.

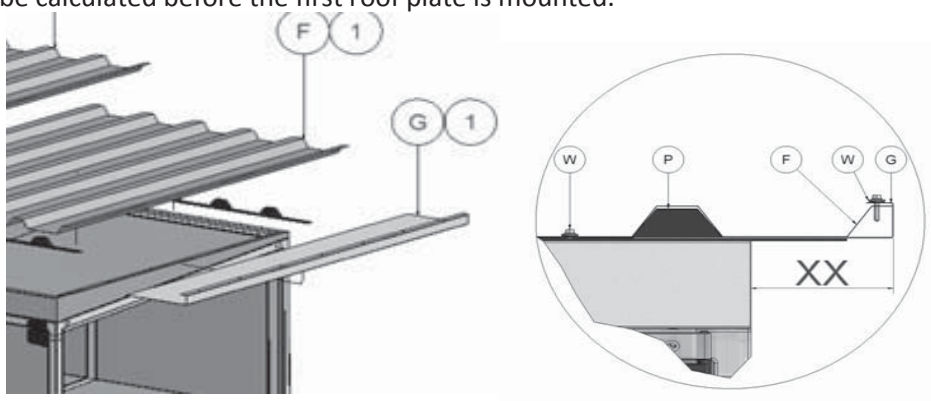
The overhang is 100 mm along each side of the smallest unit – size 10.

The overhang is 150 mm along each side of the units – size 15, 20, 25.

The overhang is 175 mm along each side of the biggest units – including size 30.

8.5 Calculation of the overhang at the ends of the unit. Mount overhang profile – G1.

The roof must be between 200 and 400 mm longer than the length of the unit to secure a roof overhang between 100 mm and 200 mm at the each of the 2 ends of the unit, and the length of this overhang must be calculated before the first roof plate is mounted.



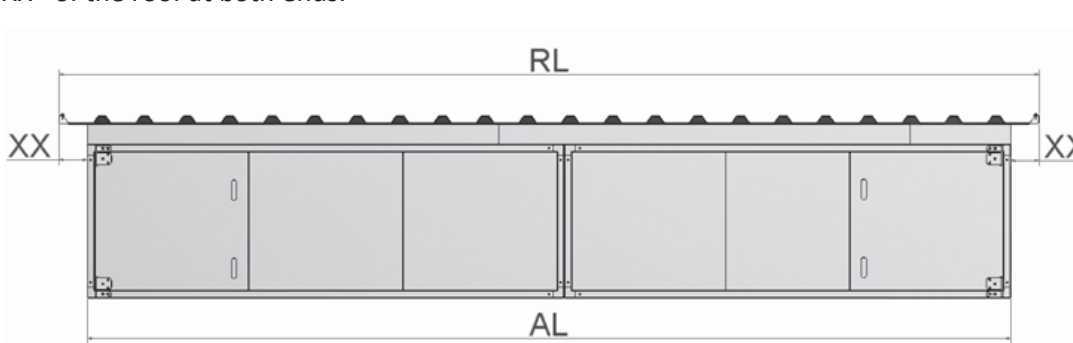
The unit is delivered with 2 similar overhang profiles - G1 and G5 - one for each end of the roof. Mount one of the 2 roof overhang profiles – G on a trapezoidal roof plate. Use the self drilling, painted screws with sealing washers - W - see the illustration.

Note: Foam bands - P – are necessary between the overhang profile G1 and the roof plate F1. See the illustration.



Self-drilling, painted screws supplied with sealing washer for the mounting of the trapezoidal plate to the roof overhang profile.

The total cover width of the trapezoidal roof plates always changes with the pitch of 207 mm between the trapezoidal ribs, making up a total length of the complete roof of - for example 2070 mm, 2277 mm, 2484 mm and so on. We call this length of the total roof for RL and we call the total length of the complete unit for AL. The trapezoidal roof must always be longer than the unit, to obtain a reasonable overhang called – XX - of the roof at both ends.



In the table below you will find 40 different lengths of roofs (always changing with the 207 mm) and the lengths of units that are ideal for each of the 39 alternative roof lengths.

Measure the total length – AL of the unit – for example 5 metres between the 4982 and 5182 mm mentioned in the table below.

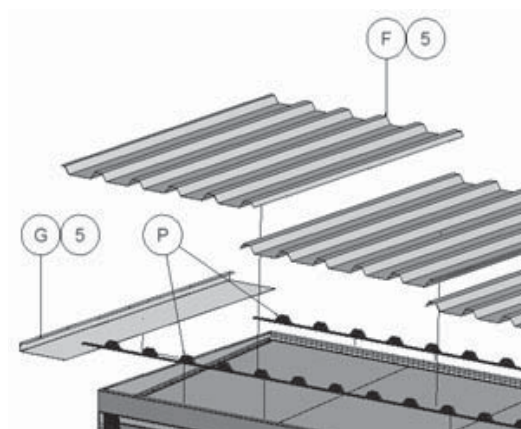
| AHU length AL | Roof length RL | | AHU length AL | Roof length RL | | AHU length AL | Roof length RL |
|------------------|----------------------|--|------------------|----------------------|--|------------------|----------------------|
| 1670 – 1870 | 2100 | | 4568 – 4768 | 4970 | | 7466 – 7666 | 8045 |
| 1877 – 2077 | 2305 | | 4775 – 4975 | 5175 | | 7673 – 7873 | 8250 |

| | | | | | | | |
|----------------|------|--|-------------|------|--|-------------|-------|
| 2084 – 2284 | 2510 | | 4982 – 5182 | 5380 | | 7880 – 8080 | 8455 |
| 2291 – 2491 | 2715 | | 5189 – 5389 | 5585 | | 8087 – 8287 | 8660 |
| 2498 – 2698 | 2920 | | 5396 – 5596 | 5790 | | 8294 – 8494 | 8865 |
| 2705 – 2905 | 3125 | | 5603 – 5803 | 5995 | | 8501 – 8701 | 9070 |
| 2912 – 3112 | 3330 | | 5810 – 6010 | 6200 | | 8708 – 8908 | 9275 |
| 3119 – 3319 | 3535 | | 6017 – 6217 | 6405 | | 8915 – 9115 | 9480 |
| 3326 – 3526 | 3740 | | 6224 – 6424 | 6610 | | 9122 – 9322 | 9685 |
| 3533 – 3733 | 3945 | | 6431 – 6631 | 6815 | | 9329 – 9529 | 9890 |
| 3740 – 3940 | 4150 | | 6638 – 6838 | 7020 | | 9536 – 9736 | 10095 |
| 3947 – 4147 | 4355 | | 6845 – 7045 | 7430 | | 9743 – 9943 | 10143 |
| 4154 – 4354 | 4560 | | 7052 – 7252 | 7635 | | | |
| 4361 - 4561 | 4765 | | 7259 - 7459 | 7840 | | | |

The mentioned length of roof – RL - for this length of unit is 5380 mm (the delivered trapezoidal plates can be combined to this length - RL = 5380 mm). 5380 mm minus 5000 mm is 380 mm overhang for both ends, and $380/2 \text{ mm} = 190 \text{ mm}$ is the overhang for each end. Place the trapezoidal roof plate F1 with the roof overhang profile G1 on rail E with an overhang of 190 mm.

8.6 Foam bands between rails and roof plates – mount roof plates.

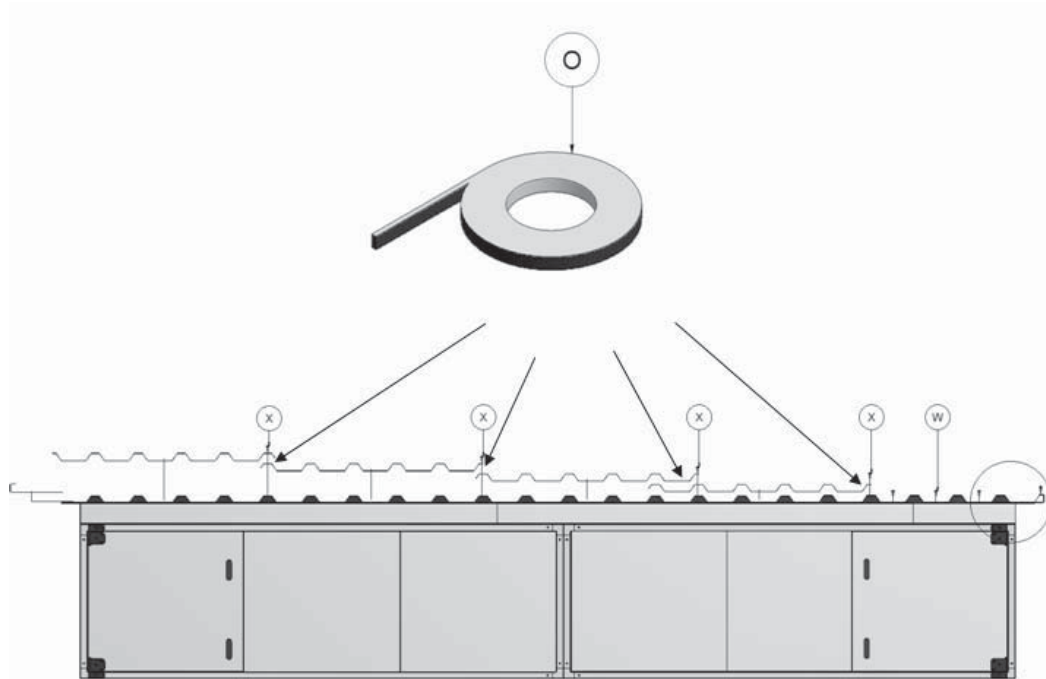
Place foam bands P between profiles A1, B2, C3, D4 and roof plates.



The trapezoidal roof plates are mounted with the self-drilling, painted screws supplied with sealing washer.

8.7 Foam bands between roof plates

Mount the self-adhesive foam band – O – on the underlapping rib for water resistant and effective sealing due to the small slope of the roof.

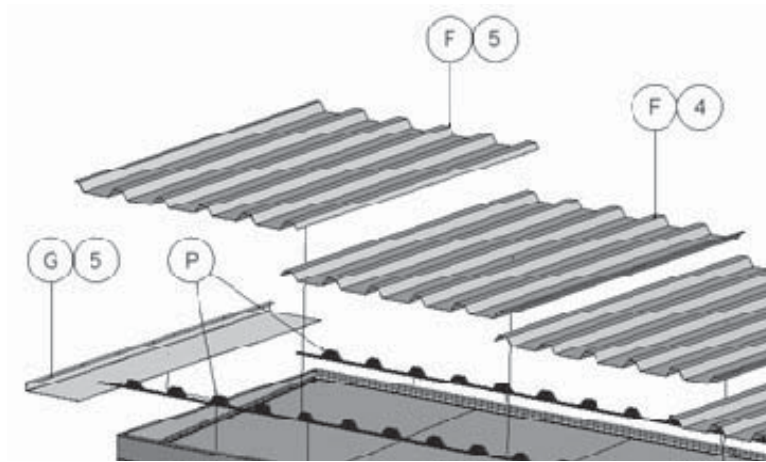


8.8 Mount roof plates – some of them are overlapping by 2 ribs

The width of each plate is always 1.035 mm and some of the plates have to overlap by 2 ribs to achieve the optimal total length of the whole roof — see the illustration above.

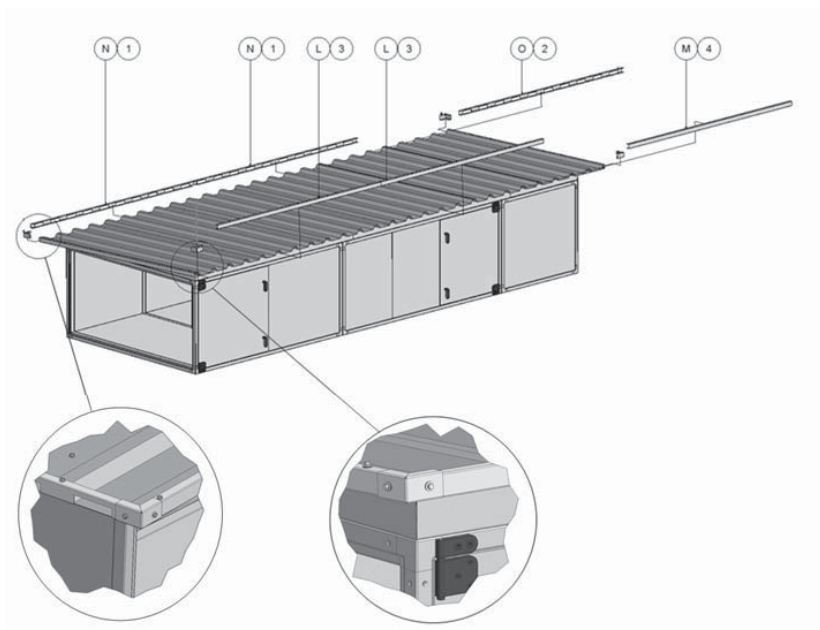
8.9 Mount overhang profile – G5 on the other end of the unit.

When the last trapezoidal plate (in this example F5) has been placed on the unit, the second roof overhang profile G5 must be pushed under the trapezoidal roof plate and mounted with the self-drilling, painted screw with sealing washer. Mounting must be similar to the mounting of roof overhang profile under the trapezoidal roof plate at the other end of the unit.



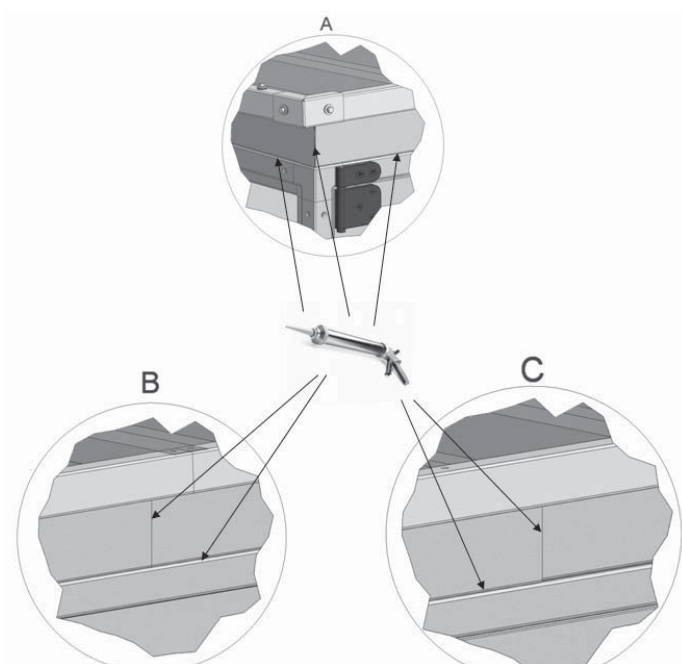
8.10 Mount side profiles and corners along the edges of the roof to protect persons

Profiles N and O with the rectangular holes are for the long and lower side of the roof because rain can escape through the holes. Mount the profiles type N first and the profile O last because the profile O goes over the profile N. Mounted in this order, the profile O can match the end of the roof and the surplus length of the profile O will just cover part of the previous profile N. Mount the profiles L and M along the long and higher front side of the roof. Mount the 4 protection corners.



8.11 Apply sealing on plate joints to ensure water resistance.

Finish installation of the steel roof by sealing all plate joints with silicone to prevent rainwater from passing into the unit. See examples below of joints to be sealed.



9.1 Speed control

The cabinet with the speed control system for the rotor is installed behind the inspection door in the rotor section.

The cabinet contains the speed controller with all components, terminal blocks, LED displaying the operation mode, the dual position DIP switch with 4 sliding levers for programming the rotor motor signal and a button for the activation of the test mode.

Through the different combinations of the 4 sliding levers of this dual position DIP switch, the correct signal is available for the 3 different motors used for the 14 sizes of air handling units. The sliding levers are set and the function is checked at the factory. The positions of the levers appear from the tables below.

9.1.1 Selection of correct signal via the 4 DIP switch levers



The 4 DIP switch levers

| Position | Function | Code |
|----------|-------------------|------|
| Up | Active = ON | 1 |
| Down | Deactivated = OFF | 0 |

The factory sets the positions of the 4 DIP switch levers for the maximum of 10 revolutions per minute for standard temperature exchangers and for hygroscopic exchangers. The position of each DIP switch lever is shown below.

| DV | Diameter of pulley | DIP switch position | Motor |
|-----|--------------------|---------------------|---------------------|
| 10 | 50 | 0000 | 90TYD-S214-M 2.8Nm |
| 15 | 50 | | |
| 20 | 50 | | |
| 25 | 65 | | |
| 30 | 65 | | |
| 40 | 65 | 1000 | |
| 50 | 71 | 0100 | 120TYD-S214-M 5.5Nm |
| 60 | 80 | | |
| 80 | 85 | | |
| 100 | 95 | | |
| 120 | 106 | | |
| 150 | 112 | | |
| 190 | 132 | 0010 | 120TYD-S214-L 7.5Nm |
| 240 | 140 | | |

The factory sets the positions of the 4 DIP switch levers for the maximum of 20 revolutions per minute for sorption exchangers. The position of each DIP switch lever is shown below.

| DV | Diameter of pulley | DIP switch position | Motor |
|-----|--------------------|---------------------|---------------------|
| 10 | 50 | 1000 | 90TYD-S214-M 2.8Nm |
| 15 | 87 | 0100 | 120TYD-S214-M 5.5Nm |
| 20 | 87 | | |
| 25 | 107 | | |
| 30 | 107 | | |
| 40 | 107 | 1100 | |
| 50 | 118 | | |
| 60 | 118 | | |
| 80 | 140 | 1010 | |
| 100 | 150 | | |
| 120 | 150 | 0110 | |
| 150 | 160 | | |
| 190 | 160 | | |
| 240 | 160 | | |

9.1.2 Indication of operation mode via red and green LED as well as test of motor

The LED is in the cover of the cabinet.

| LED indication | Value |
|---|---|
| No indication | Power off |
| Green | Ordinary operation |
| Green – flashes | Ready for operation |
| Constant green and red indication for activated rotor guard | Magnet on the rotor has activated rotor guard |
| Constant green and fast red flashes | Restart sequence active |
| Red | Rotor guard has not been activated |

| Number of red flashes in series | Value |
|---------------------------------|---------------------------|
| 1 | Output current limit |
| 2 | Over voltage |
| 3 | Under voltage |
| 4 | Failure in the controller |
| 5 | Communication failure |

Restart of rotor:

- Switch off power and switch on power again
or
- Press the test button inside the cabinet

Test of motor by checking the resistance in all 3 windings

| Motor sizes | Ohm |
|---------------|-----|
| 90TYD-S214-M | 40Ω |
| 120TYD-S214-M | 18Ω |
| 120TYD-S214-L | 10Ω |

Setting of constant speed:



- Set fourth DIP switch lever in position - ON

Test:

- Set fourth DIP switch lever in position – ON
- Press the test button

9.1.3 Copy of the label with information about connection of cables

This self-adhesive label is always placed on the cover of the cabinet. The text is always in English.

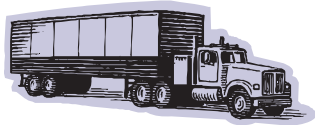
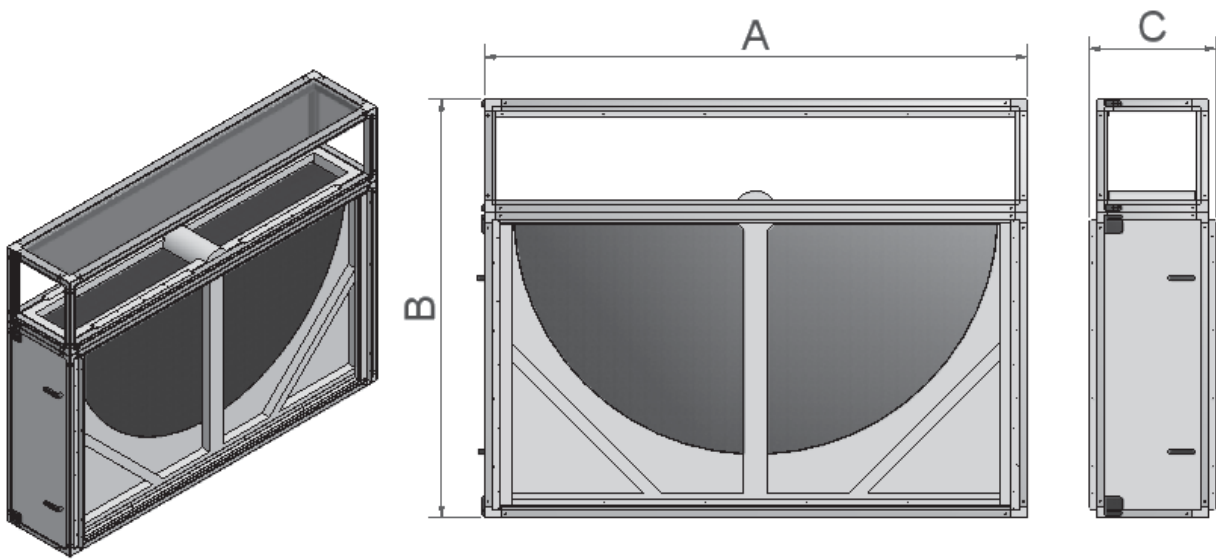
| | | | | | | | | | | | |
|---|-----------|----------|----------|-------------|-----|--------------|------|----------------|---------|---------|-----|
|  Manuel Setpoint | 9 | 10 | 11 | 12 | 13 | Black | Blue | Brown | | | |
| | Relay COM | Relay NC | Relay NO | Uin 0-10VDC | GND | Rotary Guard | GND | VCC (max 10mA) | RS485 A | RS485 B | GND |
|  Test/Reset | | | | | | | | | | | |

*Disable Rotary guard
by connecting
14 and 16.*

DIP SETTINGS:

| DIP1 | DIP2 | DIP3 | DIP4 | FUNCTION |
|------|------|------|------|-----------------------|
| OFF | OFF | OFF | --- | 90 TYD-S214-M 250RPM |
| ON | OFF | OFF | --- | 90 TYD-S214-M 275RPM |
| OFF | ON | OFF | --- | 120 TYD-S214-M 250RPM |
| ON | ON | OFF | --- | 120 TYD-S214-M 300RPM |
| OFF | OFF | ON | --- | 120 TYD-S214-L 270RPM |
| ON | OFF | ON | --- | 120 TYD-S214-L 300RPM |
| OFF | ON | ON | --- | 120 TYD-S214-L 350RPM |
| --- | --- | --- | OFF | AI 0-10V CONTROL |
| --- | --- | --- | ON | POTENTIOMETER CONTROL |

9.2 Assemble the Systemair casing for DV60, DV80, DV100, DV120 og DV150



| Size | A | B | C |
|--------|------|------|-----|
| DV 60 | 2170 | 1640 | 520 |
| DV 80 | 2320 | 1790 | 588 |
| DV 100 | 2520 | 1940 | 588 |
| DV 120 | 2890 | 2090 | 558 |
| DV 150 | 3040 | 2240 | 558 |





MOUNTING INSTRUCTIONS

for
Rotary Heat
Exchangers in split design
for types:
RRS / RRSE from the
contractual size 3001

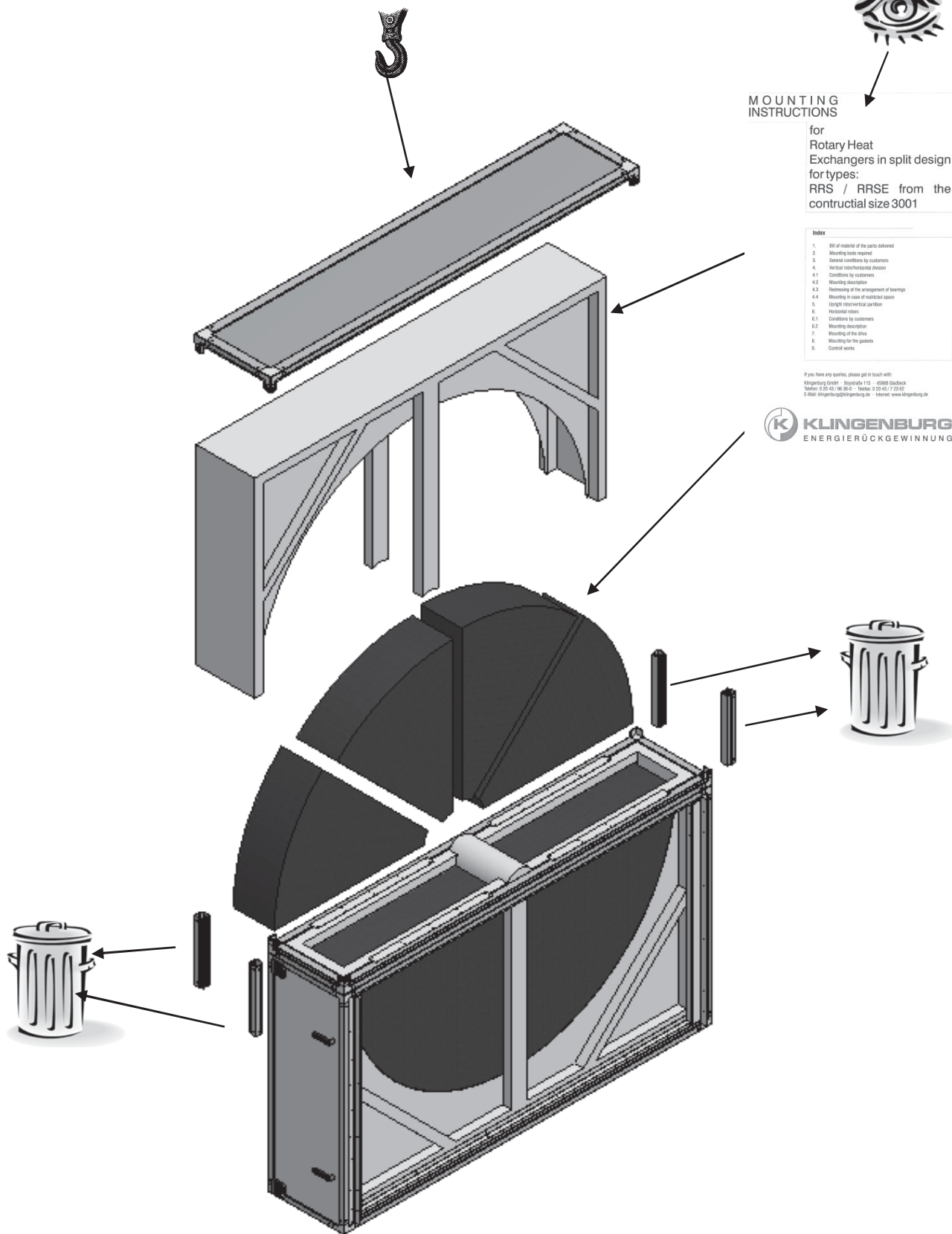
Index

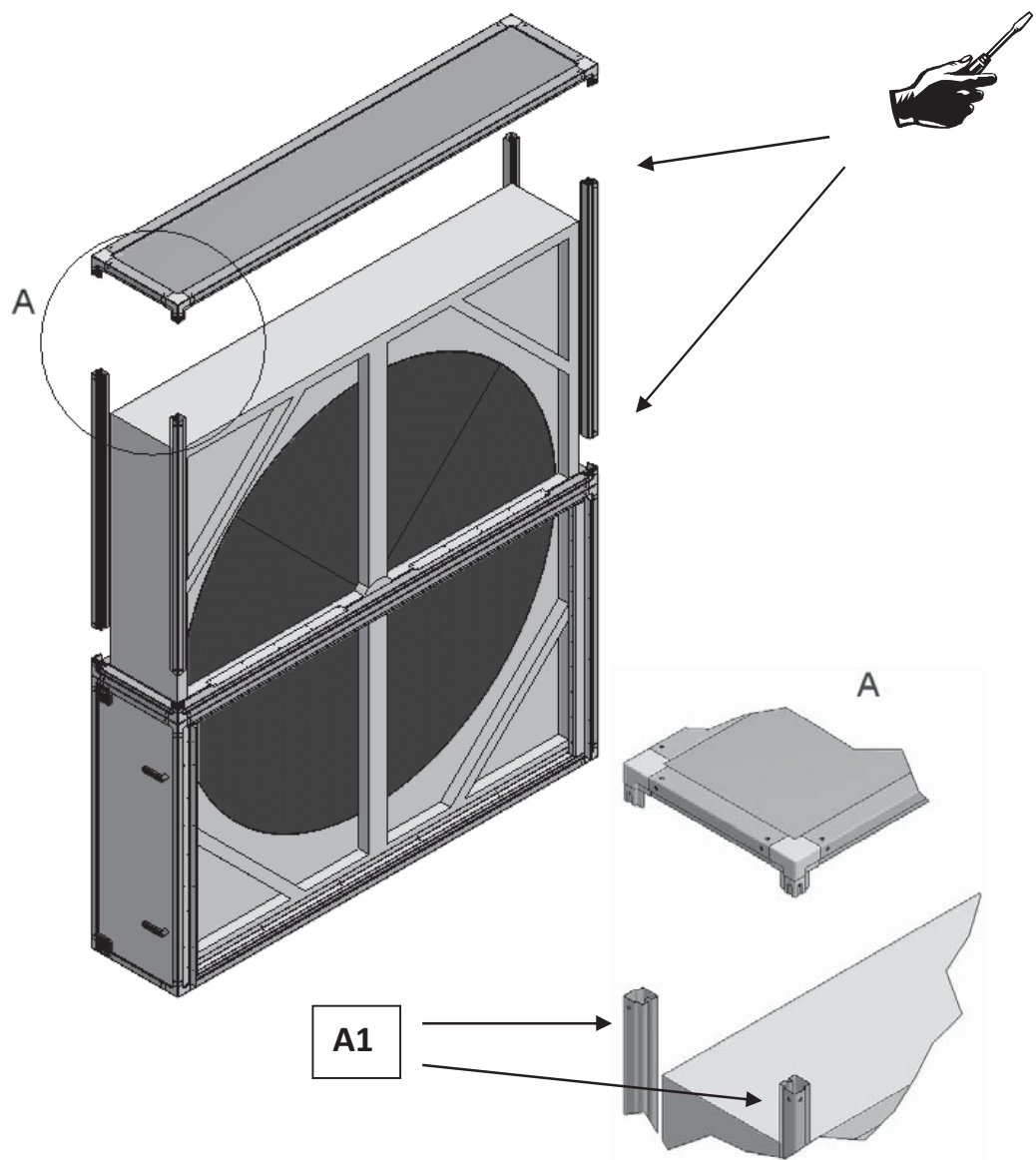
1. Bill of material of the parts delivered
2. Mounting tools required
3. General conditions by customers
4. Vertical and horizontal division
- 4.1 Conditions by customers
- 4.2 Mounting description
- 4.3 Redesigning of the arrangement of bearings
- 4.4 Mounting in case of restricted space
5. Upright and horizontal position
6. Horizontal rotor
- 6.1 Conditions by customers
- 6.2 Mounting description
7. Mounting of the rotor
8. Mounting for the gas side
9. Control works

If you have any queries, please get in touch with:
Klingenburg GmbH - Industriestraße 115 - 42699 Solingen
Telefon: 0 20 43 / 96 30-0 - Telefax: 0 20 43 / 7 33 67
E-Mail: Klingenburg@Klingenburg.de - Internet: www.Klingenburg.de

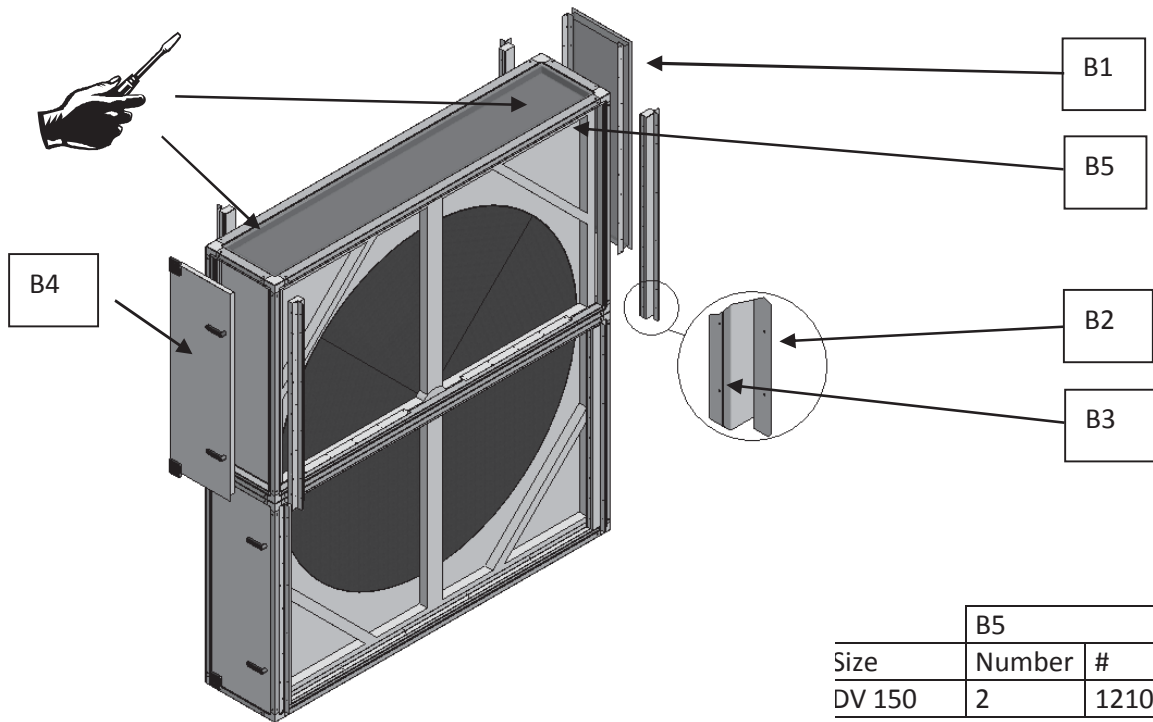


KLINGENBURG
ENERGIERÜCKGEWINNUNG



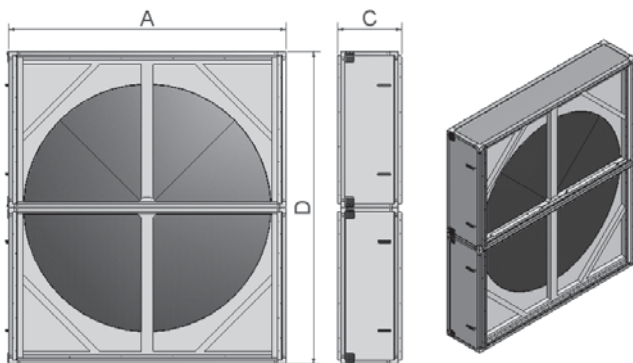


| A1 | | |
|--------|----------|-------------|
| Size | Quantity | Length (mm) |
| DV 60 | 4 | 1014 |
| DV 80 | 4 | 1164 |
| DV 100 | 4 | 1314 |
| DV 120 | 4 | 1464 |
| DV 150 | 4 | 1614 |



| B5 | | |
|--------|--------|----------|
| Size | Number | # |
| DV 150 | 2 | 12100510 |

| B1 | | | B2 | | B3 | | B4 | |
|--------|----------|----------|----------|----------|----------|----------|----------|----------|
| Size | Quantity | # | Quantity | # | Quantity | # | Quantity | # |
| DV 60 | 1 | 10122310 | - | - | - | - | 1 | 10722310 |
| DV 80 | 1 | 10122610 | 4 | 11200400 | 4 | 21000200 | 1 | 10722610 |
| DV 100 | 1 | 10122710 | 4 | 11200410 | 4 | 21000210 | 1 | 10722710 |
| DV 120 | 1 | 10122810 | 4 | 12100410 | 4 | 21000230 | 1 | 10722810 |
| DV 150 | 1 | 10122910 | 4 | 11200420 | 4 | 21000220 | 1 | 10722910 |



| Size | A | C | D |
|--------|------|-----|------|
| DV 60 | 2170 | 520 | 2240 |
| DV 80 | 2320 | 588 | 2540 |
| DV 100 | 2520 | 588 | 2840 |
| DV 120 | 2890 | 558 | 3140 |
| DV 150 | 3040 | 558 | 3440 |

9.3 Assemble divided rotor for DV 60, DV 80, DV 100, DV 120 og DV 150

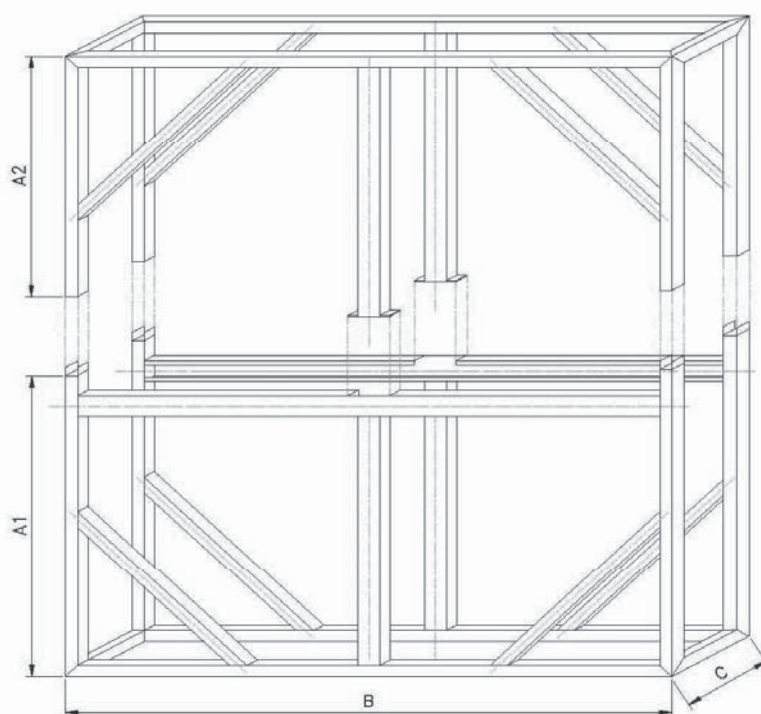


1. Bill of material of the parts delivered

As a standard the frames of the rotary heat exchangers of the constructional sizes RRS/RRSE up to 3000 are made of galvanized steel sheet.

Frame dimensions of the split heat exchangers (without packing) as follows:

| RRS / RRSE | Height A1 + A2 (mm) | Lower frame A1 (mm) | Upper frame A2 (mm) | Width (mm) | Depth (mm) |
|------------|---------------------------|---------------------------|---------------------------|---------------|---------------|
| 2500 | 2500 | 1350 | 1150 | 2500 | 440 |
| 2750 | 2750 | 1475 | 1275 | 2750 | 440 |
| 3000 | 3000 | 1600 | 1400 | 3000 | 440 |





2. Mounting tools required

In addition to the normally used mounting tools we'd recommend the use of:

- Hammer 1500 gr.
- plastic tip hammer
- hardwood
- 2 pieces round bars, $d = 25 \text{ mm}$, $l = 600 \text{ mm}$
- 2 pieces of spanners, respectively, with openings of 17, 19, 24 mm
- flexible reversible ratched handle with
 - socket for wrenches with openings of 7, 8, 17, 19 mm
 - hexagon insert socket driver 4, 6, 8, 10 mm
- electr. impact screwdriver
- engineer's pliers or side cutter
- double ladder
- screwdriver small 2,8 mm
- screwdriver big 10 mm
- 2 pieces drifts made of 12 mm round stock
- joint filling hand pistol, incl. permissable sealing materials

3. General conditions by customers

For stress-free positioning of the rotor the surface shall be flat. External forces of channel connections shall not be lead into the rotor frame. Observe that the rotor is evenly and straightly blown against. For inspection purposes the rotor shall be accessible within the installation.

4. Vertical rotor/horizontal division

4.1 Conditions by customers

A free space of at least 400 mm is required above the rotor because the upper part of the housing is placed after the mounting of the segments. In case this space is not available see details of item 4.3.

4.2 Mounting description

- Alignment of the lower part of the rotor and fixing to the floor.

This work is **not** done by Klingenburg personnel.

Important: Observe correct mounting direction of the rotor for in case of use of a scavenging chamber functioning is no longer given!



Table of frames and storage mass weights as well as the storage mass segments valid for rotary heat exchangers

| RRS / RRSE | Storage mass diameter (mm) | compl. weight exchanger (kg) | Weights frame weight (kg) | compl. Storage mass weight (kg) | Segments of storage mass |
|------------|----------------------------------|------------------------------------|------------------------------------|---------------------------------------|-----------------------------|
| 2500 | 2340 | 620 | 310 | 310 | 6 |
| 2750 | 2590 | 780 | 410 | 470 | 6 |
| 3000 | 2840 | 1000 | 600 | 400 | 6 |

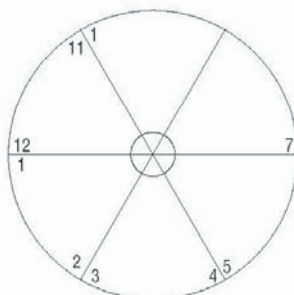
Table of mounting accessories

| RRS / RRSE | Mounting accessories of the lower part of the exchanger | | | | | |
|------------------|---|---|---|-----------------------------|---------------------------------|--|
| | nut M 16 (DIN 934) | Screw M 10 x 95 and nut (DIN 931 / 985) | Screw M 12 x 16 and nut (DIN 912 / 934) | Screw M 8 x 16 (DIN 912) | V-belt SPA incl. Lock (m) | Dust cover for bearing cover (Piece) |
| 2500 | 24 | 12 | 12 | 34 | 8,1 | 2 |
| 2750 | 24 | 12 | 12 | 34 | 9,1 | 2 |
| 3000 | 24 | 12 | 12 | 34 | 9,6 | 2 |

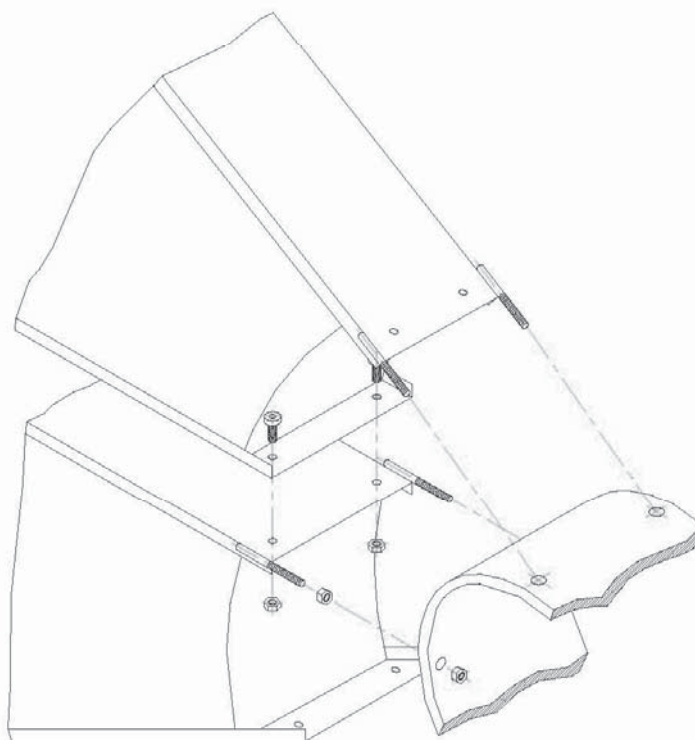


- At delivery, half of the amount of the rotor segments is already assembled and pread-justed. The connection points of the individual segments are numbered continuously.

RRS / RRSE 2500 - 3000



- Block rotor against rotation with 2 pieces round bars, ($d = 25 \text{ mm}$, $l = 600 \text{ mm}$) between the root of the rotor, the welded threaded rods at the bordering sheet and the bearing frame.
- Insert segments according to numbering. The rotor surface shall be protected during these works. Do not use plain washers!

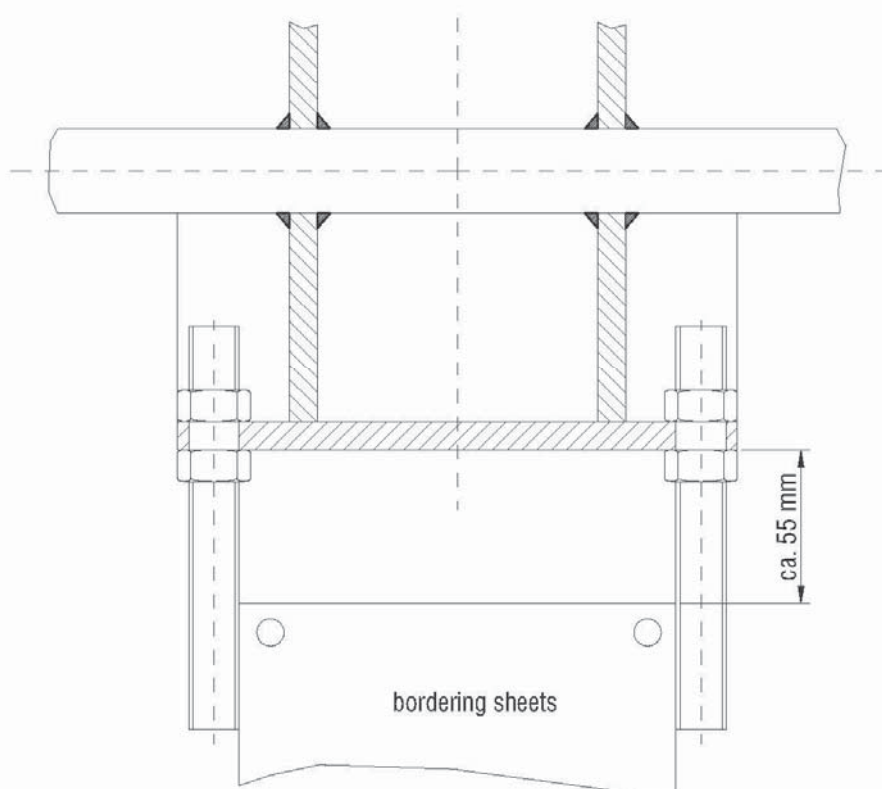


- Fix nuts of the threaded rods by a locknut.



Attention:

The space between the outer edge of the root of the rotor and the bordering sheets shall be at about 55 mm. This measure is only for your orientation to insert all segments. If this measure is not kept it is difficult to insert the last Segment.



- Install external screw fitting of the bordering sheets. Drive home screws.

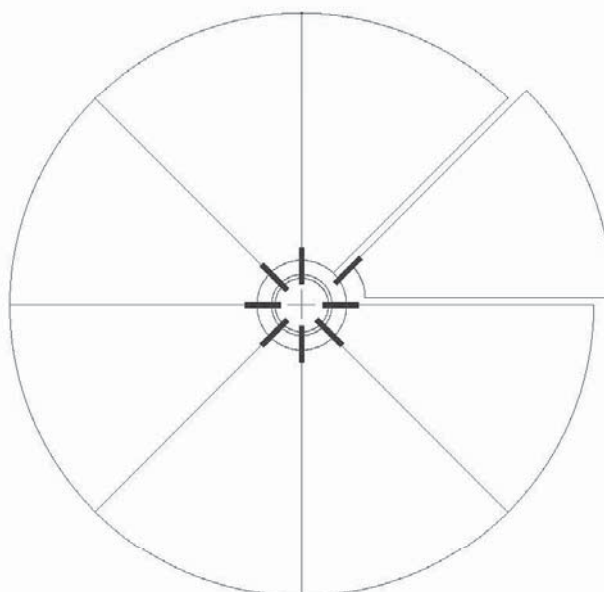
Important:

The bordering sheets shall be contiguous without gap. In case of a gap the nuts at the threaded rods have to be adjusted accordingly.



- In case of jamming of the final segment slightly loosen the neighbouring segments from the root. The final segment can be inserted into the root of the rotor with the threaded rods. In case the air gap of the last mounted segment is too big all segments have to be fetched about 2 to 4 mm closer to the root of the rotor.

Important: Drive home all screws, otherwise depth impact!



4.3 Redressing of the arrangement of bearings

The rotor bearing is basically adjusted by the manufacturer. In case of twisted assembly of the rotor, however, it may be necessary to redress the bearing.

- Mark segment bordering
- Turn rotor to the position where marked border is upside down
- Meter the distance of segment borders to rotor frame
- Turn marked border upside
- Repeat metering
- Both dimensions have to correspond with an allowance of + 2 mm
- Line bearing, if necessary
- Turn rotor to position where marked bordering is horizontal to rotor axle
- Meter distance of segment borderings to rotor frame
- Turn marked border to the other side
- Repeat metering
- Both dimensions have to correspond with an allowance of + 2 mm.
- Adjust one of the two bearings on the border frame, if necessary

Now, the rotor bearing is adjusted.

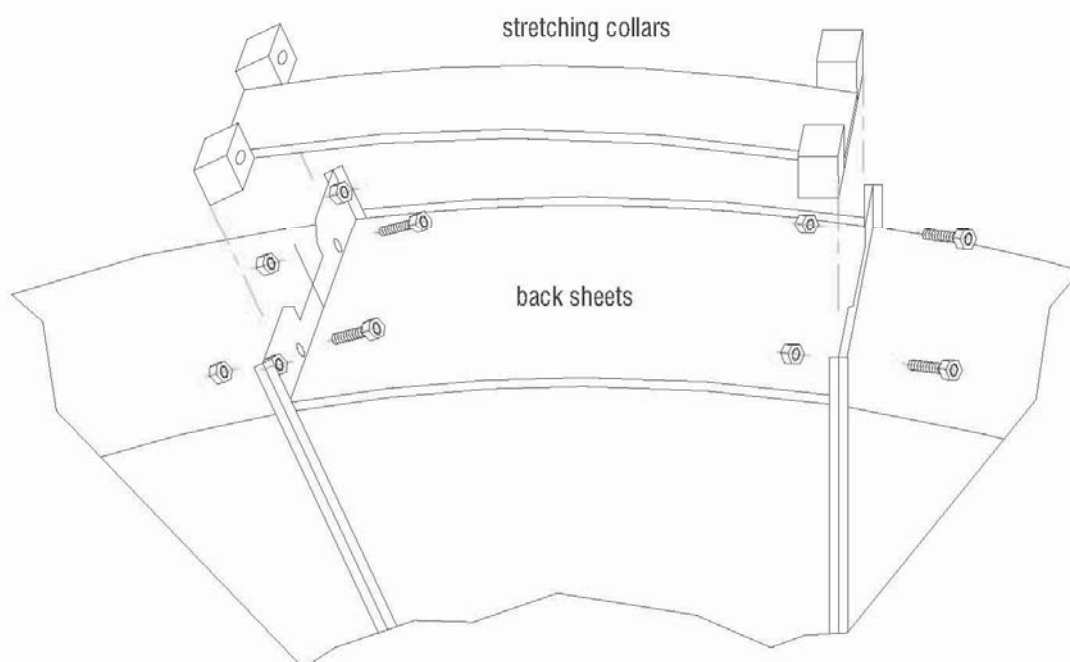


- The individual segments are adjusted at the threaded rods of the root of the rotor. A side impact exceeding 3 mm shall not be permitted.

With rotors **up to the constructional size RRS/RRSE 3000**, now back sheets and allround-stretching collars are mounted and tensed. Check again rotor alignment before final fastening of the screw connections.

Important: Even screw down of the stretching collars (2 stages)

- Fasten screws until even tensioning of the segments is visible.
- Coining of the stretching collars along the entire circumferential by means of a plastic tip hammer or hard wood and hammer. Then, refastening of all screw connections.
- Check wobble and depth impact.



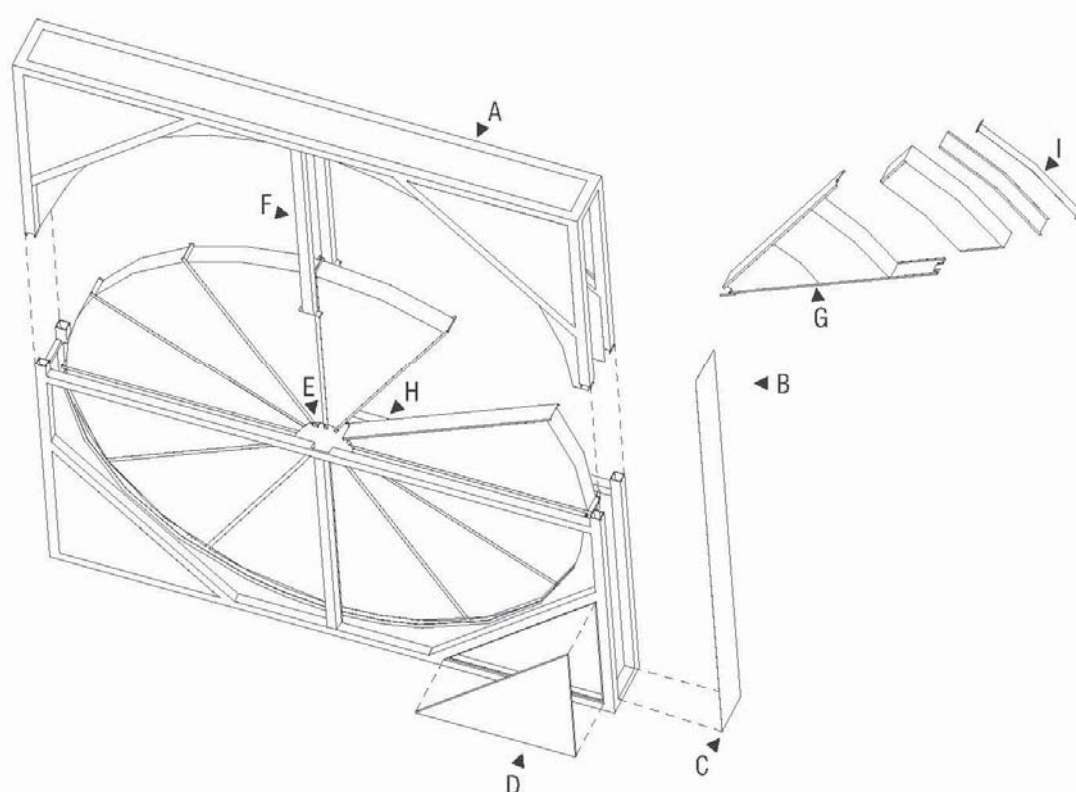
- Screw down tightly all screw connections.
- Place upper part of the housing and screw it down.



4.4 Mounting in case of restricted space

In case of insufficient space (400 mm) above the rotor the rotor housing can be assembled before inserting segments. According to the figure, the upper rotor edge can be removed. The unscrewable edge is always located above the driving motor. The rotor segments can be mounted through this opening.

- about this see item 4.2.



- A) Housings are split from rotor size 2500 on
- B) The rotors are lined with removable sheets
- C) The motor is accessible from the front, from 2500 on by a triangular door
- D) Mounting edge always located above driving motor
- E) External bearings
- F) Bearing support stretcher
- G) Rotor sector
- H) Rotor cup
- I) Stretching collar



5. Upright rotor/vertical division

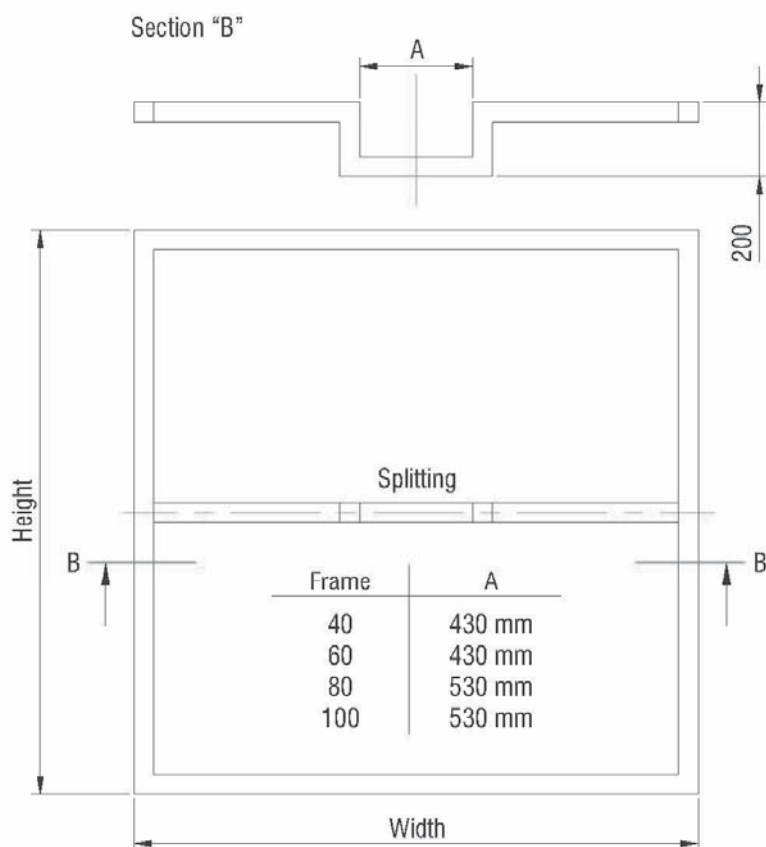
In some rare cases it may be necessary to vertically split the rotor housing. The housing, then basically, has to be completely assembled before inserting the segments. Mounting of the segments according to item 4.3.

6. Horizontal rotors

6.1 Conditions by customers

For stress-free positioning of the rotor the surface shall be flat. External forces of channel connections shall not be lead into the rotor frame. Observe that the rotor is evenly and straightly blown against.

Important: By customers, the point of support of the lower rotor bearing shall be solidly supported and easily accessible for maintenance purposes. The following describes our proposal for a corresponding design.





6.2 Mounting description

- Place housing part containing the premounted half of the rotor mass onto the seat construction.
- Stick second part of the housing and fasten frame with supporting construction.

Important: Observe correct mounting direction of the rotor!

Due to its dead weight the rotor settles about 5 mm as soon as the rotor is layed down. Therefore, the premounted rotor segments are pretensioned to this measure. Mounting of the segments is done analogous to the mounting of the upright rotors. For this see item 4.2. and 4.4.

7. Mounting of the drive

The rotor drive is premounted by the manufacturer. It is fixed to a motor-driven rocker dolly switch, which itself is kept tensioned by a tension spring. The V-belt is loosely attached. The flex connector is premounted on one side.

- Fix one end of the V-belt to the rotor circumferential by means of an adhesive or a wire and draw it around the wheel by turning the rotor.
- Shorten belt which is delivered with overlength to necessary size.
- Connect ends with flex connector.
- Put belt on pulley.
- See that V-belt is sufficiently tensioned and does not abrade at the housing.
- V-belt stretchens during operation. Thus, if necessary, it needs to be shortened.

8. Mounting of the gaskets

Center and circumferential gaskets are premounted by manufacturer. Do not press gaskets against rotor mass because the motor is exceedingly retarded and may be damaged.

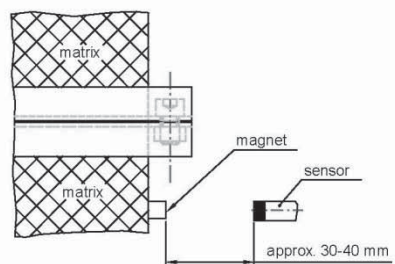
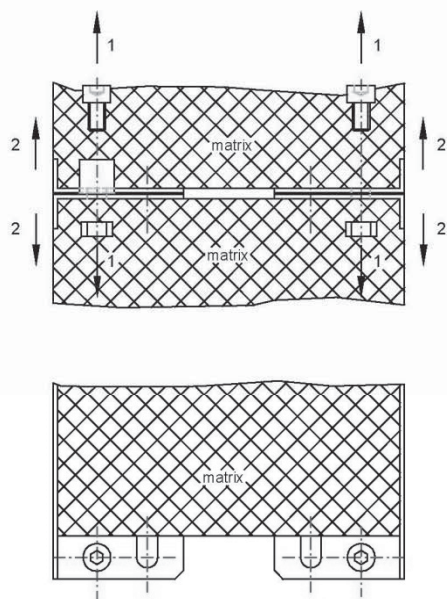
Hint: Push gaskets to final position during slow rotation of the rotor.

9. Controll works


After mounting of lateral sheet and doors the eventually existing leakages can be caulked with permanently elastic sealing material.

- Check wobble an height impact of the rotor.
- Check fastening of all screw connections.
- Check correct tensioning of the V-belt.

For informations about the connection of the driving motor see controller documentation. Fix air conduits with sheet metal screws to aluminum frame.



One magnet are fitted to each rotor in order to check the rotor running.
Only 1 magnet per rotor is required in order to trigger the cleaning-off process.

| | | |
|-----------|----------------------|---|
| | Drawing no: KL000758 | magnet for proximity switches drawing applicable to all the rotors with a split design including running control system  KLINGENBURG GmbH Boystraße 115 45968 Gladbeck |
| | Date: 03.04.06 | |
| | Processed by: Pog. | |
| | checked: | |
| | Material: | |
| Änderung: | Scale: 1:2,5 | |

9.4 Assemble divided rotor for DV 190 og DV 240

1. Stückliste | 1. Bill of material

1. Stückliste der gelieferten Teile

Die Rahmen der Rotationswärmetauscher der Baugrößen RRS ab 3001 werden standardmäßig aus verzinktem Stahlblech produziert.

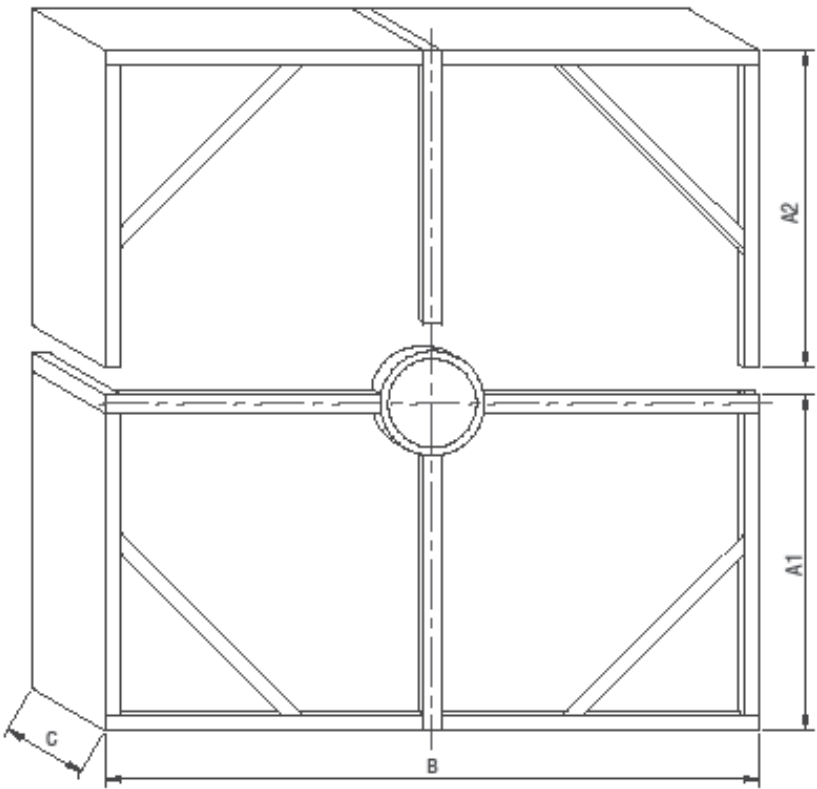
Nachfolgend die Rahmenmaße der geteilten Rotationswärmetauscher (ohne Verpackung):

1. Bill of material of the parts delivered

As a standard the frames of the rotary heat exchangers of the constructional sizes RRS from 3001 are made of galvanized steel sheet.

Frame dimensions of the split heat exchangers (without packing) as follows:

| RRS | Höhe Heigh A1 + A2 (mm) | Unterrahmen Lower Frame A1 (mm) | Oberrahmen Upper frame A2 (mm) | Breite Width (mm) | Tiefe Depth (mm) |
|------|----------------------------------|--|---|-------------------------|------------------------|
| 3500 | 3500 | 1800 | 1700 | 3500 | 550 |
| 4000 | 4000 | 2050 | 1950 | 4000 | 550 |
| 4500 | 4500 | 2300 | 2200 | 4500 | 550 |



2. Erforderliche Montagewerkzeuge

Zusätzlich zu normalen Montagewerkzeugen empfehlen wir:

- Hammer 1500 gr.
- Kunststoffhammer
- Hartholz
- 2 Stück Rundstangen D = 25 mm, L = 600 mm
- je 2 Stück Maulschlüssel 17, 19, 24 mm Schlüsselweite
- Gelenk-Umschaltkranne mit
 - Steckschlüsseleinsätze 7, 8, 17, 19 mm Schlüsselweite
 - Einsätze für Innensechskant 4, 6, 8, 10 mm
- elektr. Schlagschrauber
- Kombizange oder Seitenschneider
- Steh- oder Bockleiter
- Schraubendreher klein 2,8 mm
- Schraubendreher groß 10 mm
- 2 Stück Dorne aus 12 mm Rundmaterial
- Handfugenspistole incl. Kartuschen mit zulässigen Dichtungsmitteln

2. Mounting tools required

In addition to the normally used mounting tools we recommend the use of:

- Hammer 1500 gr.
- plastic tip hammer
- hardwood
- 2 pieces round bars, d = 25 mm, l = 600 mm
- 2 pieces of spanners, respectively, with openings of 17, 19, 24 mm
- flexible reversible ratcheted handle with
 - socket for wrenches with openings of 7, 8, 17, 19 mm
 - hexagon insert socket driver 4, 6, 8, 10 mm
- electrical impact screw driver
- engineer's pliers or side cutter
- double ladder
- screw driver small 2,8 mm
- screw driver big 10 mm
- 2 pieces drifts made of 12 mm round stock
- joint filling hand pistol, incl. permissible sealing materials

3. Allgemeine bauseitige Voraussetzungen

Der Untergrund muß eben sein, so daß der Rotor spannungsfrei aufsteht. Äußere Kräfte durch Kanalanschlüsse dürfen nicht in den Rotorrahmen eingeleitet werden. Es ist darauf zu achten, daß der Rotor gleichmäßig und gerade angeströmt wird. Der Rotor muß in der Anlage zugänglich sein, um Inspektionsarbeiten durchführen zu können.

3. General conditions by customers

For stress-free positioning of the rotor the surface shall be flat. External forces of channel connections shall not be lead into the rotor frame. Observe that the rotor is evenly and straightly blown against. For inspection purposes the rotor shall be accessible within the installation.

4. Stehender Rotor / waagerechte Teilung**4.1 Bauseitige Voraussetzungen**

Da das Gehäuseoberteil nach der Montage der Segmente aufgesetzt wird, ist oberhalb des Rotors ein freier Raum von mindestens 400 mm erforderlich. Steht dieser Raum nicht zur Verfügung, lesen Sie bitte die Ausführungen unter Punkt 4.4 auf Seite 10.

4. Vertical rotor/horizontal division**4.1 Conditions by customers**

A free space of at least 400 mm is required above the rotor because the upper part of the housing is placed after the mounting of the segments. In case this space is not available see details of item 4.4 on page 10.

4.2 Montagebeschreibung

Ausrichten des Rotorunterteils und Befestigung am Boden. Diese Arbeit wird **nicht** durch Klingenburg-Monteur durchgeführt.



Wichtig:

Achten Sie darauf, daß der Rotor richtig herum montiert wird, da ansonsten beim Einsatz einer Spülkammer die Funktion nicht mehr gegeben ist.

4.2 Mounting description

Alignment of the lower part of the rotor and fixing to the floor. This work is **not** done by Klingenburg personnel.



Important:

Observe correct mounting direction of the rotor for in case of use of a scavenging chamber functioning is no longer given!

**Aufstellung der Rahmen und Speichermassen-
gewichte sowie Anzahl der Speichermassenseg-
mente gültig für geteilte Rotationswärmetauscher**

Table of frames and storage mass weights as well
as the storage mass segments valid for rotory
heat exchangers

| RRS | Speichermasse Storage mass Ø (mm) | Gewicht komplett Tauscher complete weight exchanger [kg] | Gewicht Rahmen frame weight [kg] | Gewicht komplette Speichermasse compl. storage mass weight [kg] | Segmente der Speichermasse Segments of storage mass [kg] |
|------|---|--|--|---|--|
| 3500 | 3260 | 1170 | 630 | 540 | 8 |
| 4000 | 3760 | 1790 | 990 | 800 | 12 |
| 4500 | 4260 | 2120 | 1125 | 995 | 12 |

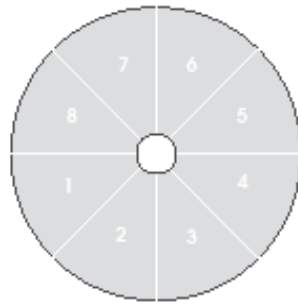
Aufstellung des Montagezubehörs

Table of mounting accessories

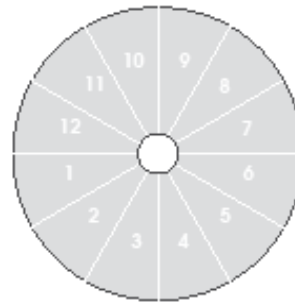
| RRS | Montagezubehör im Unterteil des Tauschers Mounting accessories of the lower part of the exchanger | | | |
|------|--|-------------------------------|-------------------------------|------------------------------|
| | Mutter M16 | Schraube M10x95 und Mutter | Schraube M12x16 und Mutter | Schneidschrsube 4,8x19 mm |
| | Nut M16 | Screw M10x95 and nut | Screw M12x16 and nut | Grub screw 4,8x19 |
| | DIN 934 | DIN 934/985 | DIN 912/934 | |
| 3500 | 32 | 16 | 32 | 20 |
| 4000 | 48 | 24 | 48 | 20 |
| 4500 | 48 | 24 | 48 | 20 |

| RRS | Keilriemen SPA inkl. Schloss V-belt SPA incl. Lock [m] | Staubdeckel zur Lagerabdeckung Dust cover for bearing cover Stück / Piece | Blindniete Stahl 3x6 mm Blind rivet steel 3x6 mm | Schraube M12x30 Screw M12x30 DIN 912 | Selbstsichernde Mutter M12 Self locking nut M12 DIN 985 |
|------|--|---|---|--|---|
| 3500 | 11,2 | 2 | 20 | 8 | 8 |
| 4000 | 12,9 | 2 | 20 | 8 | 8 |
| 4500 | 14,6 | 2 | 20 | 8 | 8 |

Bei Anlieferung sind bereits die Hälfte der Rotorsegmente montiert und vorgerichtet. Die Verbindungsstellen der einzelnen Segmente sind fortlaufend nummeriert.



RRS D=2801 • 3759



RRS D=3760 • 4760

At delivery, half of the amount of the rotor segments is already assembled and pre-adjusted. The connection points of the individual segments are numbered continuously.

■ Blockieren Sie den Rotor mit 2 Stück Rundstangen (D=25 mm, Länge=600 mm) zwischen Rotornabe, den angeschweißten Gewindestangen am Einfassungsblech und dem Lagersteg gegen Drehung.

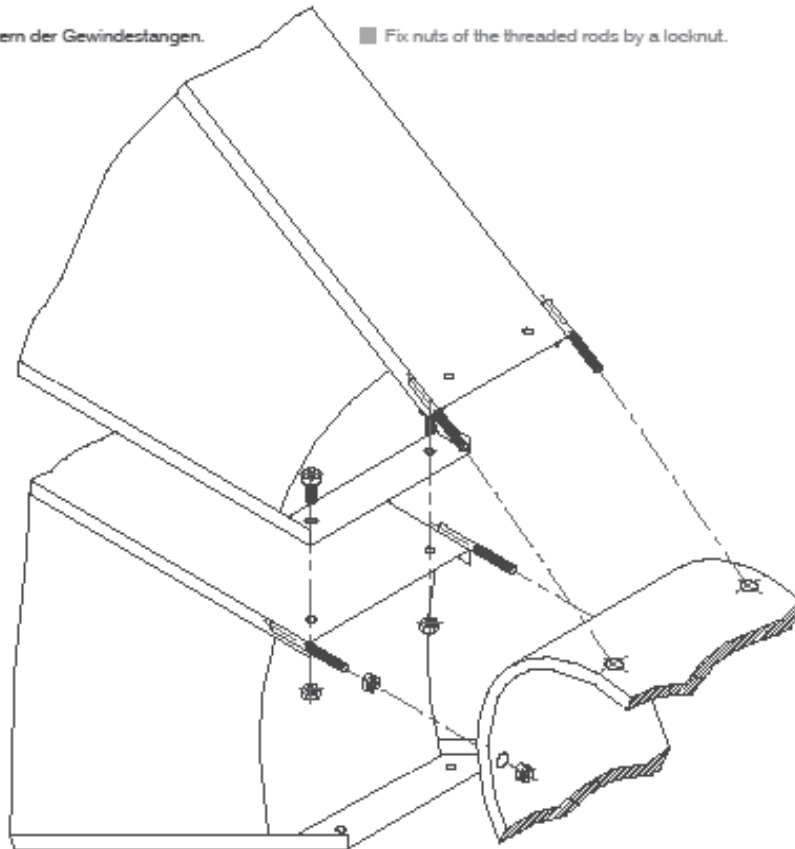
■ Block rotor against rotation with 2 pieces round bars, (d=25 mm, l=600 mm) between the root of the rotor, the welded threaded rods at the bordering sheet and the bearing frame.

■ Einsetzen der Segmente gemäß Numerierung. Die Rotoroberfläche sollte dabei geschützt werden. Keine Unterlegscheiben verwenden!

■ Insert segments according to numbering. The rotor surface shall be protected during these works. Do not use plain washers!

■ Kontorn Sie die Muttern der Gewindestangen.

■ Fix nuts of the threaded rods by a locknut.

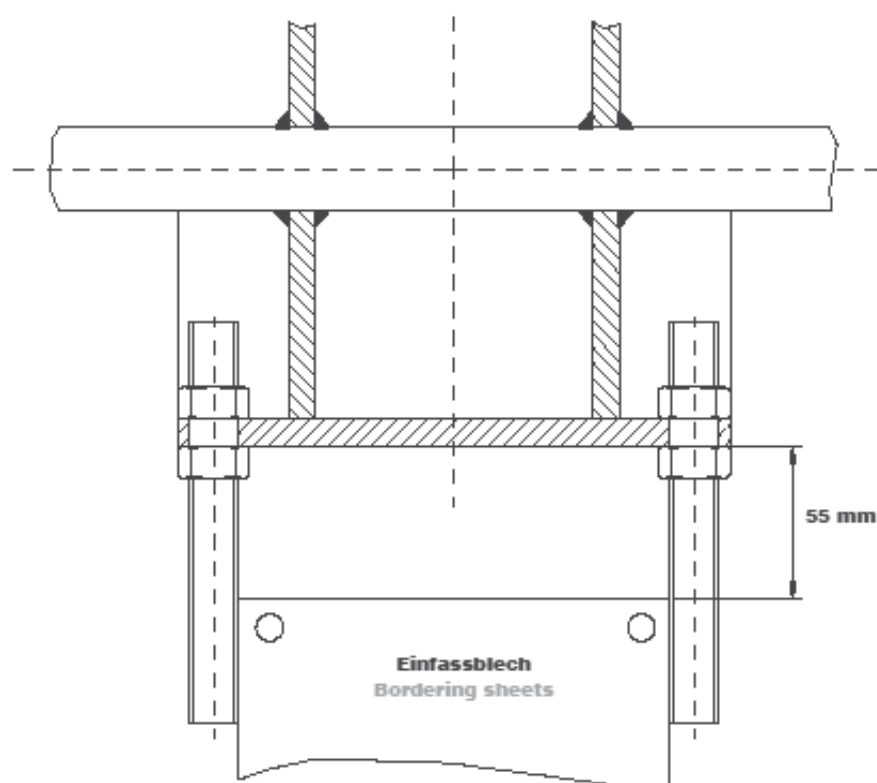


**Achtung!**

Der Abstand zwischen Außenkante Rotornabe und den Einfassblechen sollte ca. 55 mm betragen. Dieses Maß ist nur ein Anhaltswert, um alle Segmente einbringen zu können. Wird dieses Maß unterschritten, treten Schwierigkeiten beim Einbringen des letzten Segmentes auf.

**Important**

The space between the outer edge of the root of the rotor and the bordering sheets shall be at about 55 mm. This measure is only for your orientation to insert all segments. If this measure is not kept it is difficult to insert the last segment.



■ Bringen Sie die Außenverschraubungen der Einfassungsbleche an. Schrauben festziehen.

■ Install external screw fitting of the bordering sheets. Drive home screws.

**Wichtig**

Die Einfassungsbleche der Segmente müssen ohne Spalt aneinanderliegen. Falls ein Spalt vorhanden ist, müssen die Muttern an den Gewindestangen verstellt werden.

**Important**

The bordering sheets shall be contiguous without gap. In case of a gap the nuts at the threaded rods have to be adjusted accordingly.

■ Sollte das letzte Segment klemmen, schrauben Sie bitte die benachbarten Segmente etwas aus der Nabe heraus.

■ In case of jamming of the final segment slightly loosen the neighbouring segments from the root.

Mit den Gewindestangen in der Rotornabe können Sie das letzte Segment einbringen. Ist der Luftspalt des zuletzt montierten Segmentes zu groß, müssen sämtliche Segmente um ca. 2 bis 4 mm näher an die Rotornabe herangezogen werden.

The final segment can be inserted into the root of the rotor with the threaded rods. In case the air gap of the last mounted segment is too big all segments have to be fetched about 2 to 4 mm closer to the root of the rotor.



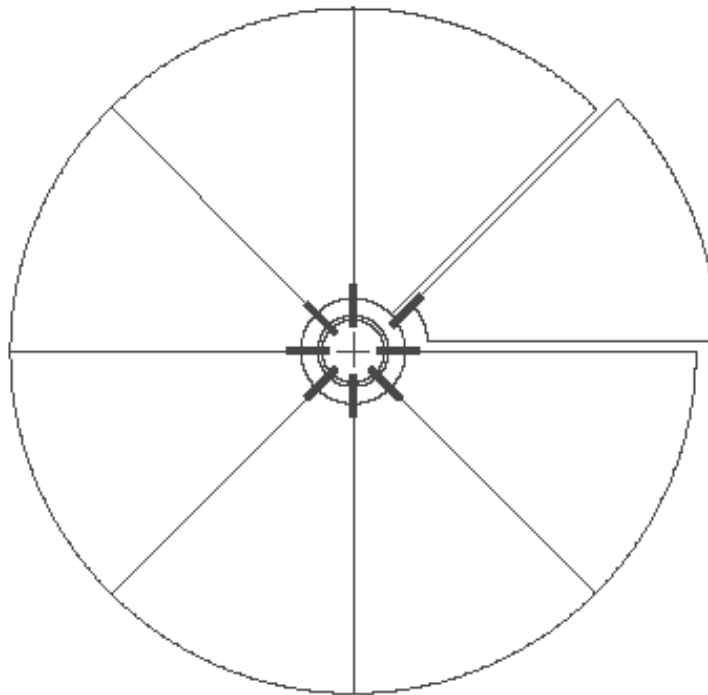
Wichtig:

Alle Segmente nachziehen, sonst Tiefenschlag!



Important:

Drive home all screws, otherwise depth impact!



4.3 Nachrichten der Rotorlagerung

Grundsätzlich ist die Rotorlagerung im Werk ausgerichtet. Sollte der Rotor jedoch verspannt eingebaut sein, kann ein Nachrichten erforderlich werden.

4.3 Redressing of the arrangement of bearings

The rotor bearing is basically adjusted by the manufacturer. In case of twisted assembly of the rotor, however, it may be necessary to redress the bearing.

- Markieren Sie hierzu eine Segmenteinfassung
- Drehen Sie den Rotor, so daß die markierte Einfassung unten liegt.
- Messen Sie den Abstand der Segmenteinfassung zum Rotorrahmen

- Mark segment bordering
- Turn rotor to the position where marked border is upside down
- Meter the distance of segment borders to rotor frame

- Drehen Sie die markierte Einfassung nach oben
- Wiederholen Sie die Messung
- Beide Maße müssen mit einer Abweichung von + 2 mm übereinstimmen
- Falls erforderlich, unterfüllen Sie die Lagerung
- Drehen Sie den Rotor, so daß die markierte Einfassung horizontal zur Rotorachse liegt
- Messen Sie den Abstand der Segmenteinfassung zum Rotorrahmen
- Drehen Sie die markierte Einfassung auf die andere Seite.
- Wiederholen Sie die Messung
- Beide Maße müssen mit einer Abweichung von + 2 mm übereinstimmen
- Falls erforderlich, verschieben Sie eines der beiden Lager auf dem Lagersteg

Die Rotorlagerung ist nun ausgerichtet.

- Die einzelnen Segmente werden an den Gewindestangen in der Rotormabe ausgerichtet. Ein Seitenschlag von mehr als 3 mm sollte nicht erlaubt sein

Bei Rotoren **ab der Baugröße RRS 3001** werden nun die Rückenbleche und Rundumspannreifen montiert und gespannt. Prüfen Sie vor dem endgültigen Anziehen der Verschraubungen noch einmal die Rotorausrichtung.

Wichtig: Gleichmäßiges Verschrauben der Spannreifen (2 Durchgänge):

- Schrauben anziehen, bis ein einheitliches Verspannen der Segmente zu sehen ist
- Mit einem Kunststoffhammer bzw. Hartholz und Handhammer die Spannreifen über den ganzen Umfang nachschlagen. Dann alle Verschraubungen nachziehen
- Seiten- und Tiefenschlag überprüfen
- Ziehen Sie sämtliche Verschraubungen fest an
- Setzen Sie das Gehäuseoberteil auf und verschrauben Sie es

- Turn marked border upside
- Repeat metering
- Both dimensions have to correspond with an allowance of + 2 mm
- Line bearing, if necessary
- Turn rotor to position where marked bordering is horizontal to rotor axle
- Meter distance of segment borderings to rotor frame
- Turn marked border to the other side
- Repeat metering
- Both dimensions have to correspond with an allowance of + 2 mm.
- Adjust one of the two bearings on the border frame, if necessary

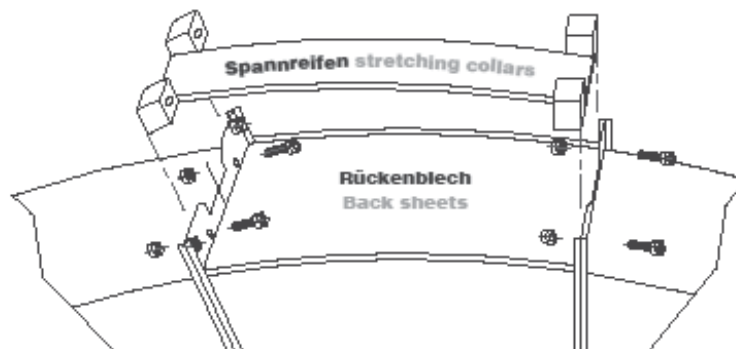
Now, the rotor bearing is adjusted.

- The individual segments are adjusted at the threaded rods of the root of the rotor. A side impact exceeding 3 mm shall not be permitted.

With rotors from the constructional size RRS 3001, now back sheets and allround-stretching collars are mounted and tensed. Check again rotor alignment before final fastening of the screw connections.

Important: Even screw down of the stretching collars (2 stages):

- Fasten screws until even tensioning of the segments is visible.
- Coining of the stretching collars along the entire circumferential by means of a plastic tip hammer or hard wood and hammer. Then, refastening of all screw connections.
- Check wobble and depth impact.
- Screw down tightly all screw connections.
- Place upper part of the housing and screw it down.



4.4 Montage unter beengten Platzverhältnissen

Steht Ihnen oberhalb des Rotors kein ausreichender Raum (ca. 400 mm) zur Verfügung, können Sie das Rotorgehäuse vor dem Einbringen der Segmente zusammensetzen. Wie in der Zeichnung ersichtlich, kann dann eine obere Rotorecke demontiert werden. Diese abschraubbare Ecke befindet sich immer überhalb des Antriebsmotors. Durch diese Öffnung werden dann die Rotorsegmente montiert.



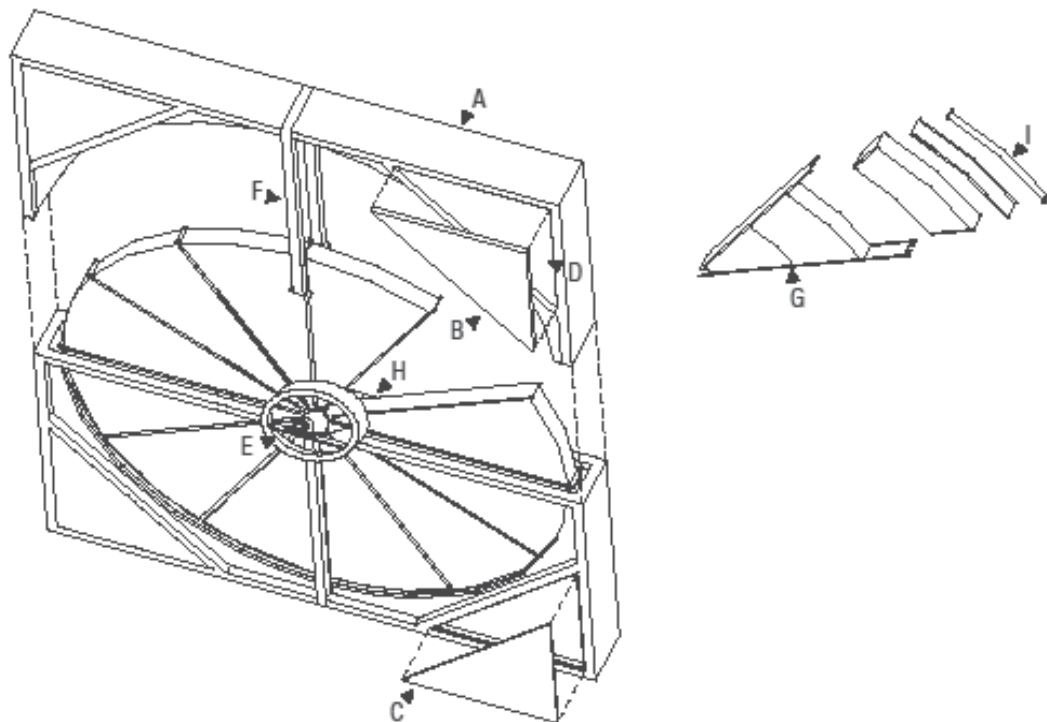
Siehe hierzu Punkt 4.2

4.4 Mounting in case of restricted space

In case of insufficient space (400 mm) above the rotor the rotor housing can be assembled before inserting segments. According to the figure, the upper rotor edge can be removed. The unscrewable edge is always located above the driving motor. The rotor segments can be mounted through this opening.



About this see item 4.2.



- A) Ab Rotorgöße 2500 sind die Gehäuse geteilt
- B) Die Rotoren sind mit abnehmbaren Dreiecksblechen ausgekleidet
- C) Der Motor ist durch Dreieckstür zugänglich
- D) Montageecke immer überhalb des Antriebsmotors.
- E) Außenliegende Lager
- F) Lagerstützstrebe
- G) Rotorsektor
- H) Rotortopf
- I) Spannreifen

- A) Housings are split from rotor size 2500 on
- B) The rotors are lined with removable sheets
- C) The motor is accessible by a triangular door
- D) Mounting edge always located above driving motor
- E) External bearings
- F) Bearing support stretcher
- G) Rotor sector
- H) Rotor cup
- I) Stretching collar

5. Stehender Rotor / Senkrechte Teilung

In seltenen Fällen kann es erforderlich sein, das Rotorgehäuse senkrecht zu teilen. Das Gehäuse muß dann grundsätzlich vor dem Einbringen der Segmente komplett zusammengebaut werden. Die Montage der Segmente erfolgt dann wie unter Punkt 4.2 beschrieben.

5. Upright rotor / vertical division

In some rare cases it may be necessary to vertically split the rotor housing. The housing, then basically, has to be completely assembled before inserting the segments. Mounting of the segments according to item 4.2.

6. Liegende Rotoren

6.1 Bauseitige Voraussetzung

Der Untergrund muß eben sein, so daß der Rotor spannungsfrei aufliegt. Äußere Kräfte durch Kanalschlüsse dürfen nicht in den Rotorrahmen eingeleitet werden. Es ist darauf zu achten, daß der Rotor gleichmäßig und gerade angeströmt wird.



Wichtig:

Der Auflagepunkt des unteren Rotorlagers ist bauseits stabil zu unterstützen und zwecks Wartungszwecken leicht zugänglich sein. Hierzu unseren Vorschlag einer entsprechenden Konstruktion.

6. Horizontal rotors

6.1 Conditions by customers

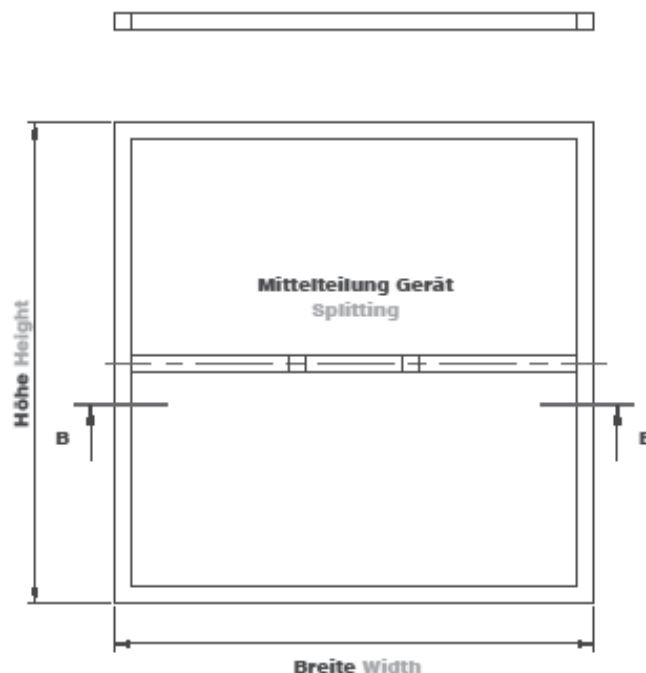
For stress-free positioning of the rotor the surface shall be flat. External forces of channel connections shall not be lead into the rotor frame. Observe that the rotor is evenly and straightly blown against.



Important:

By customers, the point of support of the lower rotor bearing shall be solidly supported and easily accessible for maintenance purposes. The following describes our proposal for a corresponding design.

Schnitt B
Section B



6.2 Montagebeschreibung

Legen Sie die Gehäusehälfte, in der die halbe Rotormasse vormontiert ist, auf die Aufnahmekonstruktion.

Stecken Sie die andere Gehäusehälfte auf und befestigen Sie den Rahmen mit der Stützkonstruktion.



Wichtig:

Achten Sie darauf, daß der Rotor richtig herum montiert wird!

Die Rotorpakete setzen sich aufgrund ihres Eigengewichtes um ca. 5 mm, sobald der Rotor gelegt wird. Deshalb sind die vormontierten Rotorpakete um dieses Maß vorgespannt. Die Montage der Segmente verläuft analog zu der der stehenden Rotoren. Lesen Sie dazu bitte unter Punkt 4.2. und Punkt 4.4.

6.2 Mounting description

Place housing part containing the premounted half of the rotor mass onto the seat construction.

Stick second part of the housing and fasten frame with supporting construction.



Important:

Observe correct mounting direction of the rotor!

Due to its dead weight the rotor settles about 5 mm as soon as the rotor is layed down. Therefore, the premounted rotor segments are pretensioned to this measure. Mounting of the segments is done analogous to the mounting of the upright rotors. For this see item 4.2. and 4.4.



7. Montage des Antriebs

Der Rotorantrieb ist werkseitig vormontiert worden. Er ist auf einer Motorwippe befestigt, die durch eine Zugfeder unter Spannung gehalten wird. Der Keilriemen ist lose beigelegt. Der Gelenkverbinder ist einseitig vormontiert.

- Befestigen Sie ein Ende des Riemens mit einem Klebeband oder Draht am Rotorumfang und ziehen Sie es durch Drehung des Rotors um das Rad herum.
- Kürzen Sie den Riemen, der mit Überlänge geliefert wird, auf das erforderliche Maß.
- Verbinden Sie die Enden mit dem Gelenkverbinder
- Legen Sie ihn auf die Riemenscheibe auf
- Achten Sie darauf, daß der Keilriemen ausreichend gespannt ist und nicht am Gehäuse schleift
- Während des Betriebes verlängert sich der Keilriemen. Er muß gegebenenfalls gekürzt werden



7. Mounting of the drive

The rotor drive is premounted by the manufacturer. It is fixed to a motor-driven rocker dolly switch, which itself is kept tensioned by a tension spring. The V-belt is loosely attached. The flex connector is premounted on one side.

- Fix one end of the V-belt to the rotor circumferential by means of an adhesive or a wire and draw it around the wheel by turning the rotor.
- Shorten belt which is delivered with overlength to necessary size.
- Connect ends with flex connector.
- Put belt on pulley.
- See that V-belt is sufficiently tensioned and does not abrade at the housing.
- V-belt stretches during operation. Thus, if necessary, it needs to be shortened.

8. Montage der Dichtungen

Die Mittel- und Rundumdichtungen sind ab Werk vormontiert. Zu starkes Andrücken der Dichtungen gegen die Rotormasse ist zu vermeiden, da der Motor dadurch zu stark gebremst wird und beschädigt werden kann.



Tipp:

Schieben Sie die Dichtungen bei langsam drehendem Rotor in ihre endgültige Position.

8. Mounting of the gaskets

Center and circumferential gaskets are premounted by manufacturer. Do not press gaskets against rotor mass because the motor is exceedingly retarded and may be damaged.



Hint:

Push gaskets to final position during slow rotation of the rotor.

9. Kontrollarbeiten

Nachdem Sie die Seitenbleche und Türen angebracht haben, können Sie eventuelle Undichtigkeiten mit dauerelastischem Dichtungsmaterial abdichten.

- Prüfen Sie den Seiten- und Höhengschlag des Rotors
- Prüfen Sie, ob sämtliche Verschraubungen angezogen sind
- Prüfen Sie, ob der Keilriemen ausreichend gespannt ist

Informationen zum Anschluß des Antriebsmotors entnehmen Sie bitte den Reglerunterlagen.

Die Luftkanäle werden mit Blechtreibschrauben am Aluminiumrahmen befestigt.

9. Controll works

After mounting of lateral sheet and doors the eventually existing leakages can be caulked with permanently elastic sealing material.

- Check wobble an height impact of the rotor.
- Check fastening of all screw connections.
- Check correct tensioning of the V-belt.

For informations about the connection of the driving motor see controller documentation.

Fix air conduits with sheet metal screws to aluminum frame.

Wir hoffen Ihnen mit dieser Anleitung geholfen zu haben. Sollten jedoch einmal Probleme oder Fragen auftauchen, so kontaktieren Sie uns:

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We hope to be of assistance to you with this information. If there are any further questions, please do not hesitate to contact us anytime.

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9.5 Installation of motor that turns rotor and sensor for rotation

Installation of rotor motor and sensor for control of rotation in DVC module after assembly of divided rotor

Fig. 1

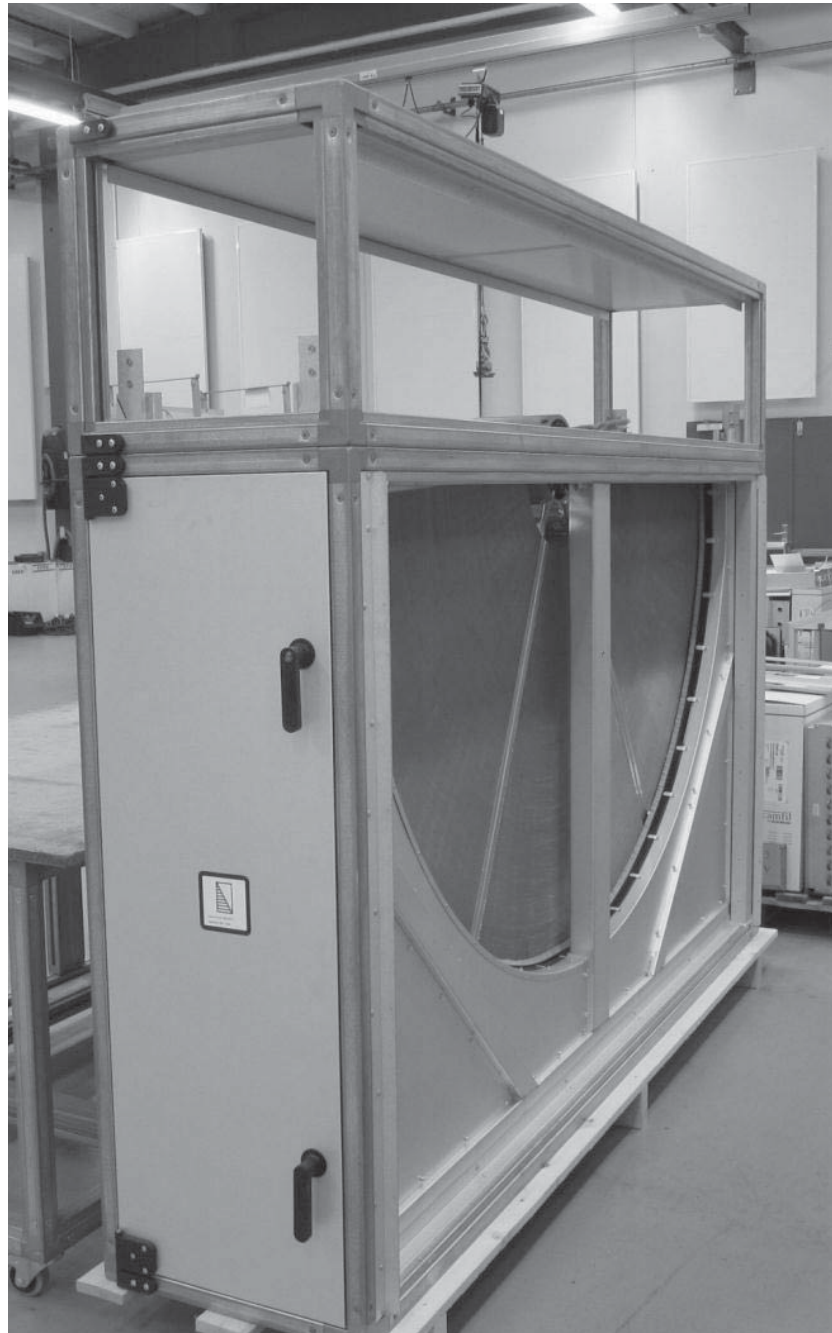


Fig.2



Fig. 2

By delivery of a DVC module with divided rotor, the motor is installed before delivery to the customer

Fig.3

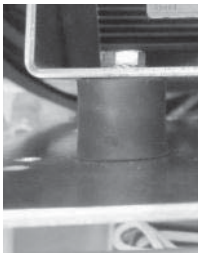


Fig.4

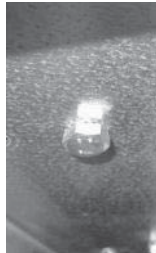


Fig.5



Fig. 3, 4 and 5

The motor and console is secured to the motor plate by 4 shock absorbers mounted by M8 bolts.

Fig.6

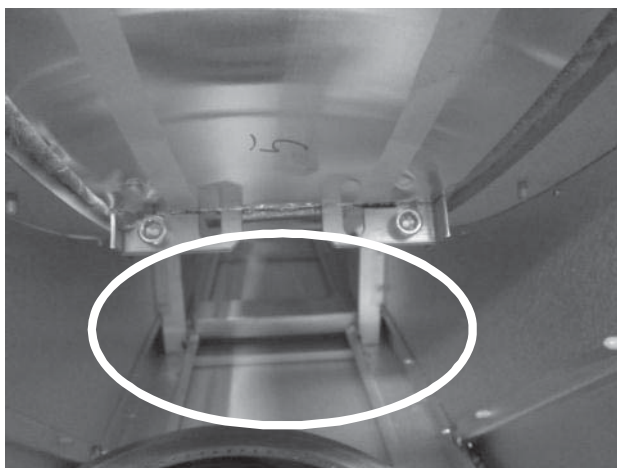


Fig. 2 og 6

The drive belt must be placed around the rotor and in the center position of the rotor. Observe brackets for assembly of the rotor segments.



Fig.8

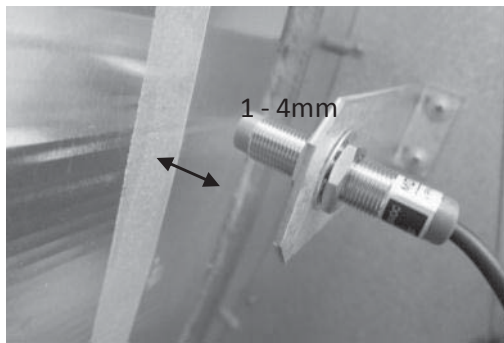


Fig.9

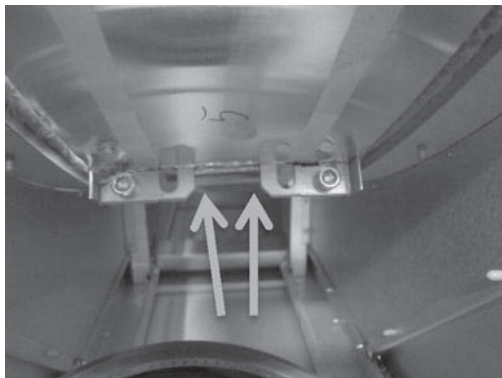


Fig. 7 and 8

. Sensor for control of rotation must be installed by the installer. The distance must be 1-4 mm from the outmost brackets used for the assembly of the rotor segments.

Fig. 9

Please be aware of the height of the brackets that are used for the assembly of the rotor segments. Please turn the rotor to check the sensor do not touch any of the brackets.

Annex 10.

Reversible heat pump unit for cooling and heating

10.1 DVU-HP section (reversible heat pump unit)

The air handling unit section – DVU-HP – is a separate section in the air handling unit, containing a complete stand-alone reversible heat pump system (heating and cooling). The system has been tested and optimized before delivery. The refrigerant is evaporated and condensed directly in the integrated batteries and the capacity is controlled automatically and steplessly between 5 and 100 %.

The system is delivered with the refrigerant R-410a in the circuit. In the section an internal controller - pCOOEM - and a complete system control all safety functions as well as the capacity of the digital scroll compressor (digital compressor and additional on/off compressor in the larger units DV 20 – DV 80). The system creates exactly the capacity requested by the main air handling unit controller via a 0-10V DC control signal. When a demand for heating or cooling occurs, the main air handling unit controller sends a start signal for heating or a start signal for cooling as well as a capacity signal 0-10V DC to the internal controller in this section. When the signal exceeds 1.6 V DC, the digital compressor starts. After start-up the capacity is regulated between 5 and 50 % by the digital scroll compressor - C1 and Q6 - in the illustration below. When more than 50 % of the capacity is demanded, the control signal exceeds 5.0 V DC and the second compressor, C2 starts. Then the capacity of the digital compressor is reduced to the minimum and with increasing demand gradually increased to 100% capacity. The reverse sequences are activated by declining demand until the demand is less than 5 %. If the control signal is below 0.5V DC, the system will stop.

A full envelope control system in the internal control system prevents operation that exceeds safe conditions for any of the components. Signals from the high and low pressure transmitters, K3 and K4, contribute with information to ensure maximum performance without exceeding the set value and thereby prevent safety switches for the HP and LP, K1 and K2 from disconnecting cooling or heating. This system ensures maximum performance under the given flows and temperatures of supply air and exhaust air.

The system includes 2 electronic expansion valves. One for heating mode - Q3, and one for cooling mode - Q2. Super heat is controlled by the build-in controller and is based on signal showing the evaporating pressure measured by LP transmitter and temperature sensor placed in the common suction line at the compressor console. This ensures a very accurate and efficient performance of the system under all operating conditions.

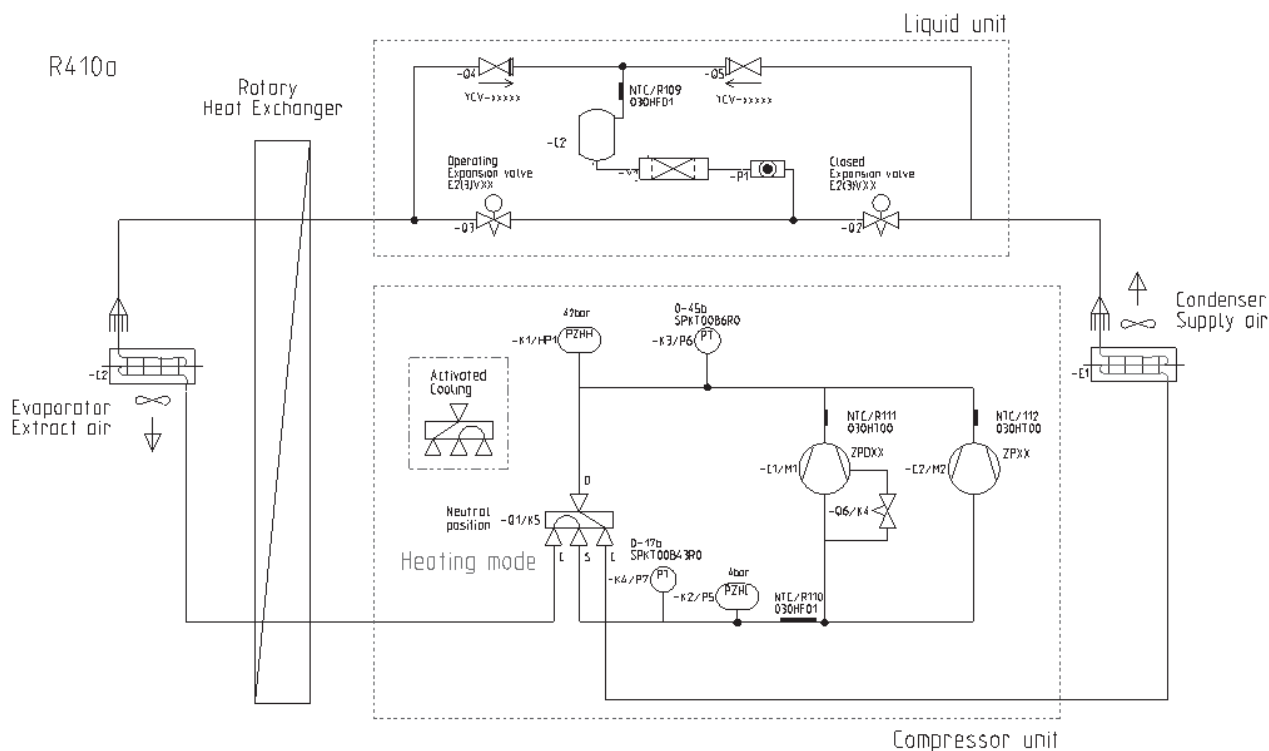
A 4-way valve Q1 changes the function of the system between heating and cooling mode.

The evaporator (condenser in cooling mode) on the DVU-HP unit is placed in the extract air flow after the rotary heat exchanger. This makes it possible to utilize the heat exchanger in booth heating and cooling mode for recovery of energy. This will minimize the power consumption of the compressor system.

A heating element has been installed below the evaporator in the drip tray to prevent ice buildup during heating operation.

During heating operation, it is necessary to deice the evaporator in the exhaust air when operating at low outdoor temperatures. In the integrated control system, there is an advanced software function to detect the ice build-up. When ice build-up is at a certain level, a deicing cycle is initiated. During this cycle, the refrigeration system will reverse to bring energy to the coil in the exhaust air, to melt the ice. Once the control system detects that ice is gone, the system returns to normal heating operation. A very quick and efficient cycle.

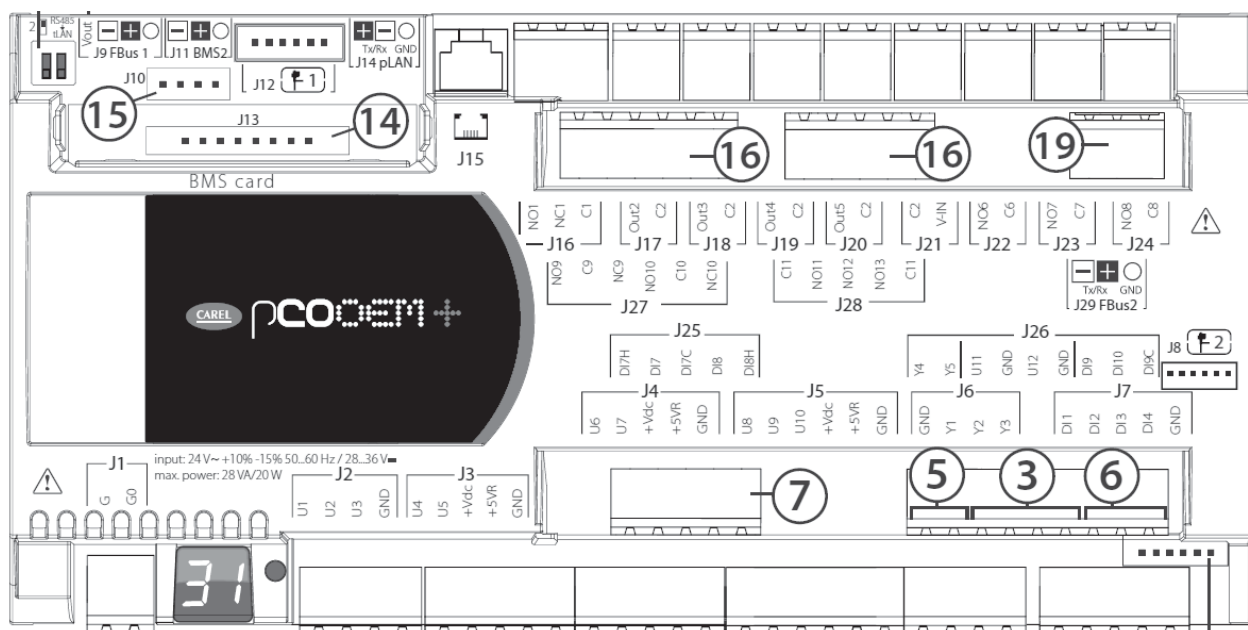
10.1.1 DVU-HP – Heat pump circuit



10.1.2 DVU-HP- Electrical documentation

Wiring diagram for the integrated control system is available in a separate document.

At power up, 2-segment LED display will light up with moving dots until controller and display is ready for operation.



10.1.3 Control signals







| Signal: | Terminals: | Electrical: |
|-------------------|------------|----------------------------------|
| Start (Heat mode) | X5; 18-19 | Potential free contact |
| Cooling demand | X5; 16-17 | Potential free contact |
| Capacity | X5; 10-11 | 10: gnd. 11: 0-10V _{DC} |
| Alarm | X5; 25-26 | Potential free contact |

10.2 DVU-HP-internal controller for the compressor system

Control panel pGD1 placed inside the integrated control cabinet



The control panel has 6 buttons with the following functions

| | |
|--|---|
|  - <i>Alarm</i> | Display the list of active alarms Manually reset alarms |
|  - <i>Prg</i> | Access the service menu |
|  - <i>Esc</i> | Return to the previous screen |
|  - <i>Up</i> | Navigate between the display screens or increase/decrease values |
|  - <i>Down</i> | |
|  - <i>Enter</i> | Switch from parameter display to edit Confirm value and return to the parameter list |

By flashing red alarm light, there is an active alarm and display is not in alarm view.

By permanent red alarm light, there is an active alarm and display is in alarm view

10.3 Background illumination of the display

Background illumination of the display switches on automatically when the first push button is activated.

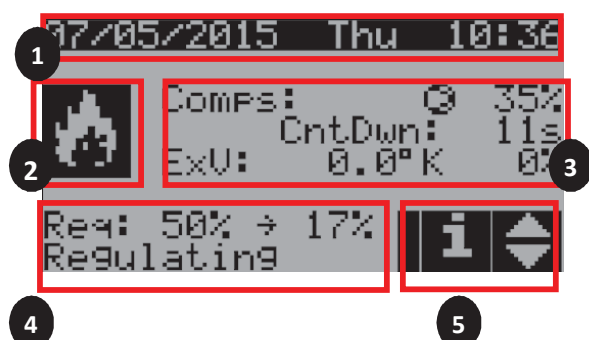
The illumination switches off some time after the last activation. By alarm the red alarm button flashes until the alarm is acknowledged.

10.4 Menu – drawing of the menu structure to guide the user





Overview of the menus appears from annex 11.

10.5 The start display, Main menu

The following screen displays an example of the main screen with an active unit, highlighting the fields and icons used:



1. Date and Time
2. Current unit status:

| | |
|---|------------------------|
|  | Unit OFF |
|  | Summer mode (cooling) |
|  | Winter mode (heating) |
|  | Defrosting in progress |

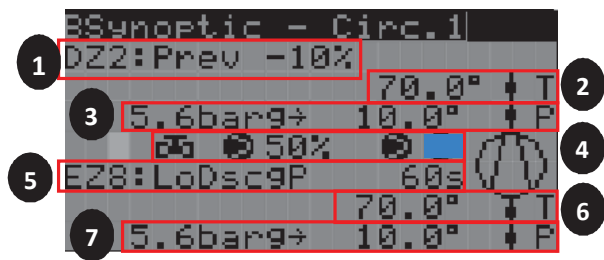
3. Devices status
 - a. Compressors in operation and digital capacity. Digital 35% output, fixed off)
 - b. Timer in action, Min on/off time, Min time between starts
 - c. Super Heat and Expansion valve opening
4. System capacity request and actual power output
 - a. System status
 - i. System OFF
 - ii. ON by input, but no capacity signal
 - iii. Regulating
 - iv. Pump-Down, and count down
 - v. Defrosting, and count up
 - vi. Manual mode
 - vii. OFF alarm
5. Indicates access to the info menu using the DOWN button

10.6 Settings

From the main screen, the DOWN (UP) button can be used to scroll through the status of devices. No password is needed to access these variables.

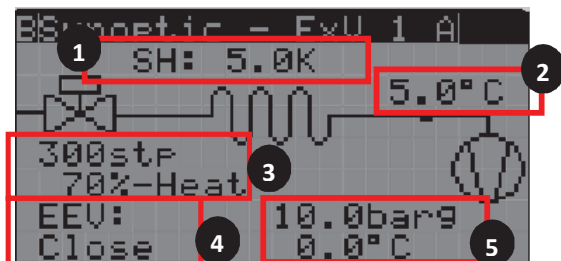
The physical status of inputs, outputs and transmitters are all available in the menus. The individual screens are shown below.

Compressor status:



1. Discharge temperature zone and prevent action.
2. Discharge temperature
3. Condensing pressure and temperature
4. Compressors status and digital percentage;
5. Envelope zone and time:
 - EZ1:Ok: zone within operating limits
 - EZ2:HiDP: High compression ratio
 - EZ3:HiDscgP: High condensation pressure
 - EZ4:HiCurr: High motor current
 - EZ5:HiSuctP: High suction pressure
 - EZ6:LoDP: Low differential pressure
 - EZ7:LoPRat: Low compression ratio
 - EZ8:LoDscgP: Low condensation pressure
 - EZ9:LoSuctP: Low evaporation pressure
6. Suction gas temperature
7. Evaporating pressure and temperature

Expansion Valve Overview:



1. Super Heat and actual set-point
2. Suction gas temperature
3. Valve opening mode, percentage and steps;
4. Valve status:
 - Close: valve closed
 - Std-by: system stop position
 - Pos: fixed position during sequence
 - Wait: after positioning and in case of change of cooling capacity greater than 10%, the valve to do large movement that can take some seconds. Wait will be displayed during this phase.
 - On: valve in regulaton
 - Init: driver initialization
5. Evaporating pressure and temperature

Status Information:

```

Info
Press ENTER to check
advanced devices info

→ I/O status
→ Working hours
→ Devices in manual
→ System info

```

Push Enter to get the following information:

```

Info - Output
Comp.1-Digital scroll

N011 On
N02 Digital valve Off
Power: 100.0%
Hours: 0000/030000h

```

```

Info - Output
Compressor 2

N012 Off

Hours: 0000/030000h
N010 Discharge al. Off

```

```

Info - Output

Y1-Envelop: 0.0%
Y2-Comp.fbk: 100.0%
Y3-ExU Perc.: 0%

```

```

Info - Input
Capacity reference

U7 50.2%

```

```

Info - Input

ID1-Alarm reset: Off
ID2-Cooling: Cool
ID3-Defrost: Ok
ID4-Remote ON: On

```

```

Info - Input
Defrost

Evap.temp.: 0.0°C
Filtered: 0.0°C
CntDwn: 2990 0
Defrost status:
Check start 5s

```

```

Info - Input
Suction Pressure
U6: 0.0barg
Evap.temp.: 0.0°C
Suction temperature
U2: 0.0°C

```

```

Info - Input
Discharge Pressure
U5: 27.0barg
Cond.temp.: 45.8°C
Discharge temperature
U4: 15.7°C
Subcool.temp.: 5.7°C
Subcooling: 0.0°C

```

```

Info - Input
Discharge temperature
U11 Comp.2: 0.0°C
U12 Comp.3: 0.0°C
Optional Probes
U8: 0.0°C
U9: 0.0°C
U10: 0.0°C

```

```

Information
NOSTDmCOMM
Version: 2.1.009
Date: 06/05/15

Bios: 6.27 09/07/04
Boot: 5.00 09/07/04

```

```

Information
Board type:
Board size:
Total flash: 2048KB
RAM: 1024KB
Built-In type:
Main cycle:
4.8cycle/s 208ms

```

```

Info - Dig.In
ID7-Comp.alarm:      Ok
ID8-Phase alarm:     Ok
ID9-Low Press.:      Ok
ID10-High Press.:    Ok

```

10.7 Service

Regardless of the displayed screen, pressing the programming key accesses the password entry screen which allows access to the menu shown below for service level. Enter the password (1111) and push enter. Once the password is entered, it will be maintained for 5 minutes from the last time a key was activated. Then the password will have to be re-entered in order to access the service level again. In the Log-Out menu, you can log-out without waiting 5 minutes.

Service level gives read access to all parameters with the ability to edit some of them. For more information on the parameters that can be changed, see the parameter table. Default password: 1111.



As soon as the password is entered in the log in screen, and function selected, the access level needed to edit the values is shown. As shown in the following screens, S flashing for Service and M for Manufacturer:

```

M Manual mode
Comp.1 circuit 1
Hours:          0001h
Next thr.:      30000h
Status:         100%
Manual:         AUTO

```

```

M ExU
Enable PUMPdown: YES
Type:            AT STOP

```

10.8 Manual operation

From the menu – Manual mode – it is possible to operate components manually. The technician can control the operation of components manually. This procedure is relevant for the test during the annual maintenance with the control of all safety and control functions or after exchange of components. Menus as follows:

In the first screen above: Compressor 1 status. Actual operating hours. Next threshold of operating hours for service can be set. Current capacity and selection of manual mode.

```
Manual mode
Comp.2 circuit 1
Hours:          0000h
Next thr.:      30000h
Status:         Off
Manual:         AUTO
```

Compressor 2 status. Actual operating hours. Next threshold of operating hours for service can be set. Current status and manual selection.

When operating compressors manually, Super Heat control will still be active as long as set to Auto.

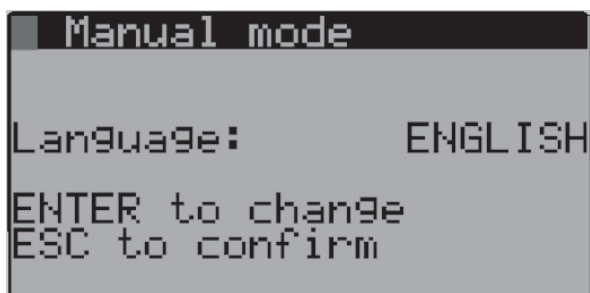
```
B Manual mode
ExV circ.1 heating
Enable manual
valve position:  B
Manual valve
Position:       IIIIste
```

Preliminary

Expansion valves can be operated manual individually. The valve do have 0-480 steps

```
S Manual mode
Day:          7
Month:        5
Year:         15
              Thursday
Hour:         12
Minute:       22
```

Date and time



Only English is available

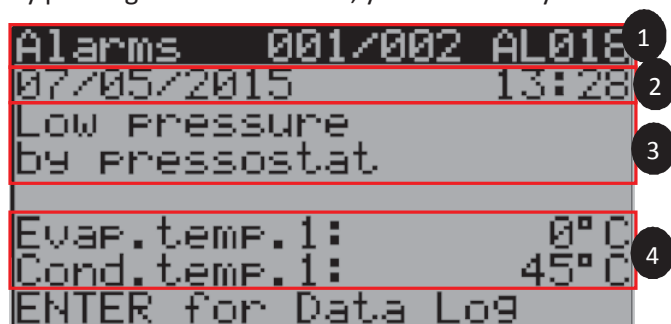
10.8.1 Running hours

This is available in the menu for maintenance.

10.9 Alarm

10.9.1 Alarm

By pushing the Alarm button, you can see any active alarm.



1. Alarm 1 of 2 active alarms which has not been reset. Alarm number from list below
2. Time and date of alarm
3. Alarm type
4. Operating conditions at the point of alarm

10.9.2 Alarm Log

By using the enter key you can enter the alarm log. Up to 100 alarms are saved.

10.9.3 Alarm reset

Alarms can be reset manually, automatically or with retries.

- Manual reset: When the alarm condition is no longer present, you must enter alarm menu and acknowledge the alarm by pushing the alarm button. Now the unit can restart.
- Automatic reset: When the alarm condition is gone, the system will automatically restart. Still holding min off time.
- Automatic reset with retries: Retry conditions are checked, if OK, it will be automatic reset mode. If not, it will be manual reset mode.

10.9.4 Alarm list

| Code | Description | Reset | Action | Delay |
|-------|--------------------------------------|-------|------------------|-----------|
| AL001 | Probe U1 broken or disconnected | A | None | 10s |
| AL002 | Probe U2 broken or disconnected | A | Circuit OFF | No |
| AL003 | Probe U4 broken or disconnected | A | Circuit OFF | 10s |
| AL004 | Probe U5 broken or disconnected | A | Circuit OFF | No |
| AL005 | Probe U6 broken or disconnected | A | Circuit OFF | 10s |
| AL006 | Probe U7 broken or disconnected | A | None | No |
| AL007 | Probe U8 broken or disconnected | A | None | 10s |
| AL008 | Probe U9 broken or disconnected | A | None | 10s |
| AL009 | Probe U10 broken or disconnected | A | None | 10s |
| AL010 | Probe U11 broken or disconnected | A | Compressor 2 OFF | 10s |
| AL011 | Probe U12 broken or disconnected | A | Compressor 3 OFF | 10s |
| AL012 | Low SH alarm | M | Circuit OFF | 180s |
| AL013 | LOP alarm | A | Circuit OFF | 180s |
| AL014 | MOP alarm | A | Circuit OFF | 180s |
| AL015 | Low suction temp. | A | Circuit OFF | 180s |
| AL016 | High discharge press. | M | Circuit OFF | 3 retries |
| AL017 | Low suction pressure | A | Circuit OFF | 3 retries |
| AL018 | Low pressure by pressostat | A | Circuit OFF | 3s |
| AL019 | Envelope alarm | A | Circuit OFF | 300s |
| AL020 | Motor phase alarm | A | Circuit OFF | No |
| AL021 | High pressure by pressostat | M | Circuit OFF | 3 retries |
| AL022 | High discharge temp. compressor 1 | A | Circuit OFF | 60s |
| AL023 | High discharge temp. compressor 2 | A | Compressor 2 OFF | No |
| AL024 | High discharge temp. compressor 3 | A | Compressor 3 OFF | No |
| AL025 | Pump-down end for max time circuit 1 | A | None | No |
| AL026 | Maintenance request compressor 1 | A | None | Parameter |
| AL027 | Maintenance request compressor 2 | A | None | Parameter |
| AL028 | Maintenance request compressor 3 | A | None | Parameter |
| AL029 | Clock alarm | A | None | No |
| AL030 | Memory expansion damaged | A | None | No |

10.10 Maintenance

General maintenance must be carried out according to national and local regulations by a skilled technician from a certified company.

List of spare parts as well as datasheets from the manufacturers are available on the DVD delivered with the unit.

10.11 DVU-HP- Data

Dimensions, heating and cooling capacity, refrigerant content

| DVU-HP | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 80 |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Width in mm | 970 | 1120 | 1270 | 1420 | 1570 | 1720 | 2020 | 2170 | 2170 |
| Height in mm | 970 | 1120 | 1270 | 1420 | 1570 | 1720 | 2020 | 2240 | 2540 |
| Length in mm | 1420 | 1420 | 1420 | 1420 | 1570 | 1570 | 2320 | 2460 | 2460 |
| Weight in kg | 190 | 240 | 280 | 375 | 400 | 550 | 700 | 1000 | 1200 |
| Power supply – 3 phase + N + PE 3x400V + N + PE | | | | | | | | | |
| Pre fuse Amp. | 10A | 16A | 20A | 25A | 32A | 40A | 50A | 63A | 63A |
| Refrigerant | R410a | R410a | R410a | R410a | R410a | R410a | R410a | R410a | R410a |
| Refrigerant content in kg | 3 | 4 | 6 | 8 | 10 | 12 | 24 | 26 | 28 |
| Test pressure, 46,2 bar | | | | | | | | | |
| Nominal air volume, m3/s | 1.0 | 1.4 | 1.9 | 2.4 | 2.9 | 3.6 | 5.0 | 5.9 | 6.7 |
| Cooling capacity, kW | 14 | 18 | 27 | 32 | 37 | 47 | 64 | 78 | 80 |

Values based on 50°C condensing temperature and 10° evaporating temperature

Detailed performance data can be found by using design program SystemairCAD

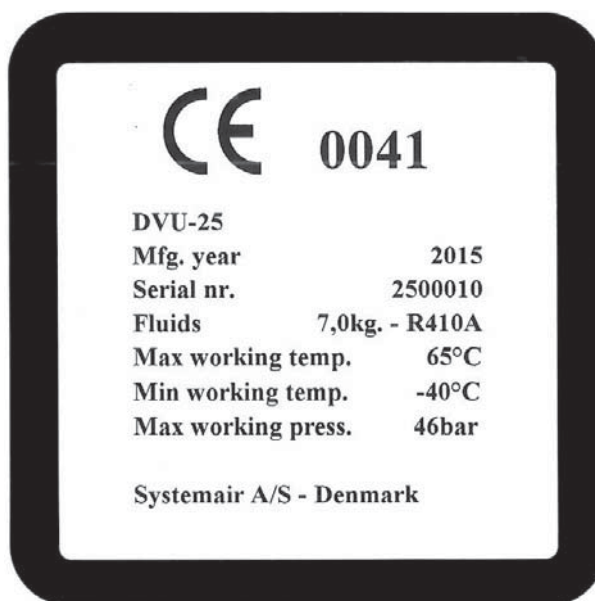
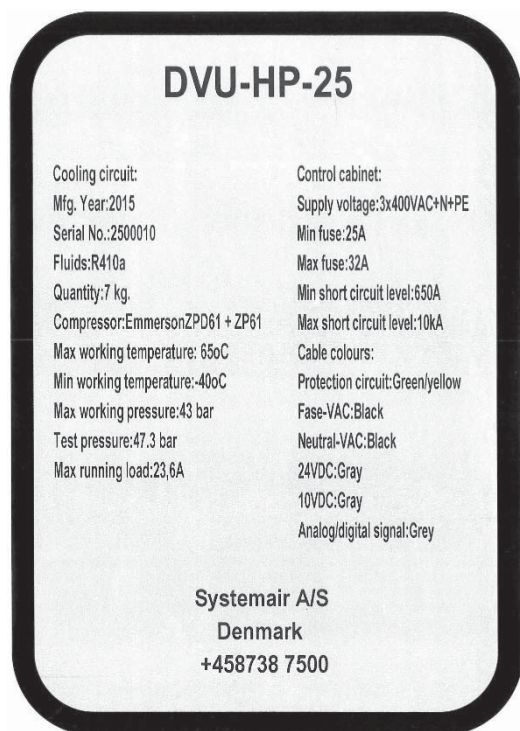
10.12 Data plate

The data plate for the cooling unit is mounted inside the unit section – DVU-HP – behind one of the doors.

An example of the data plate is shown below.

Inside the unit

Outside on the unit



Control cabinet:

Supply voltage: 3x400VAC+N+PE

Min fuse: 63A

Max fuse: 80A

Min short circuit level: 650A

Max short circuit level: 10kA

Cable colors:

Protection circuit: Green/yellow

Phase-VAC: Black

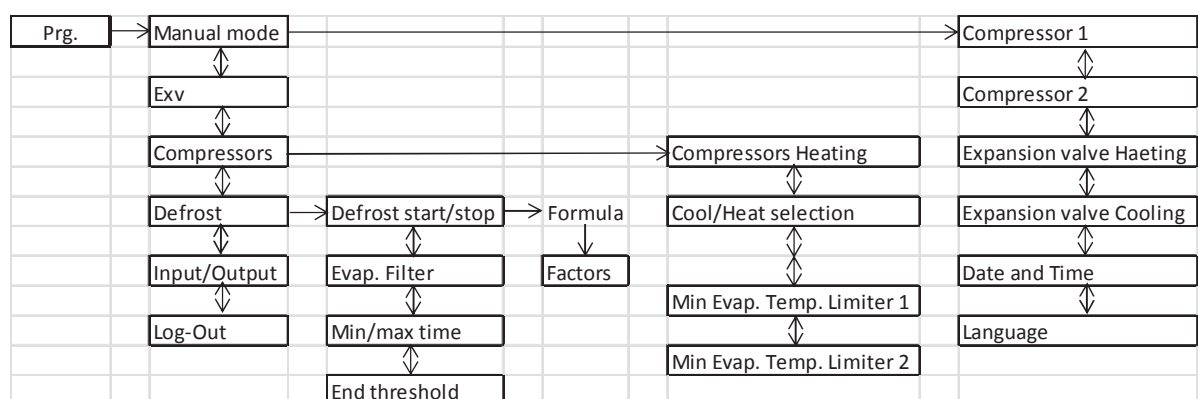
Neutral-VAC: Black

24VDC: Grey

0VDC: Grey

Analog/digital signal: Grey

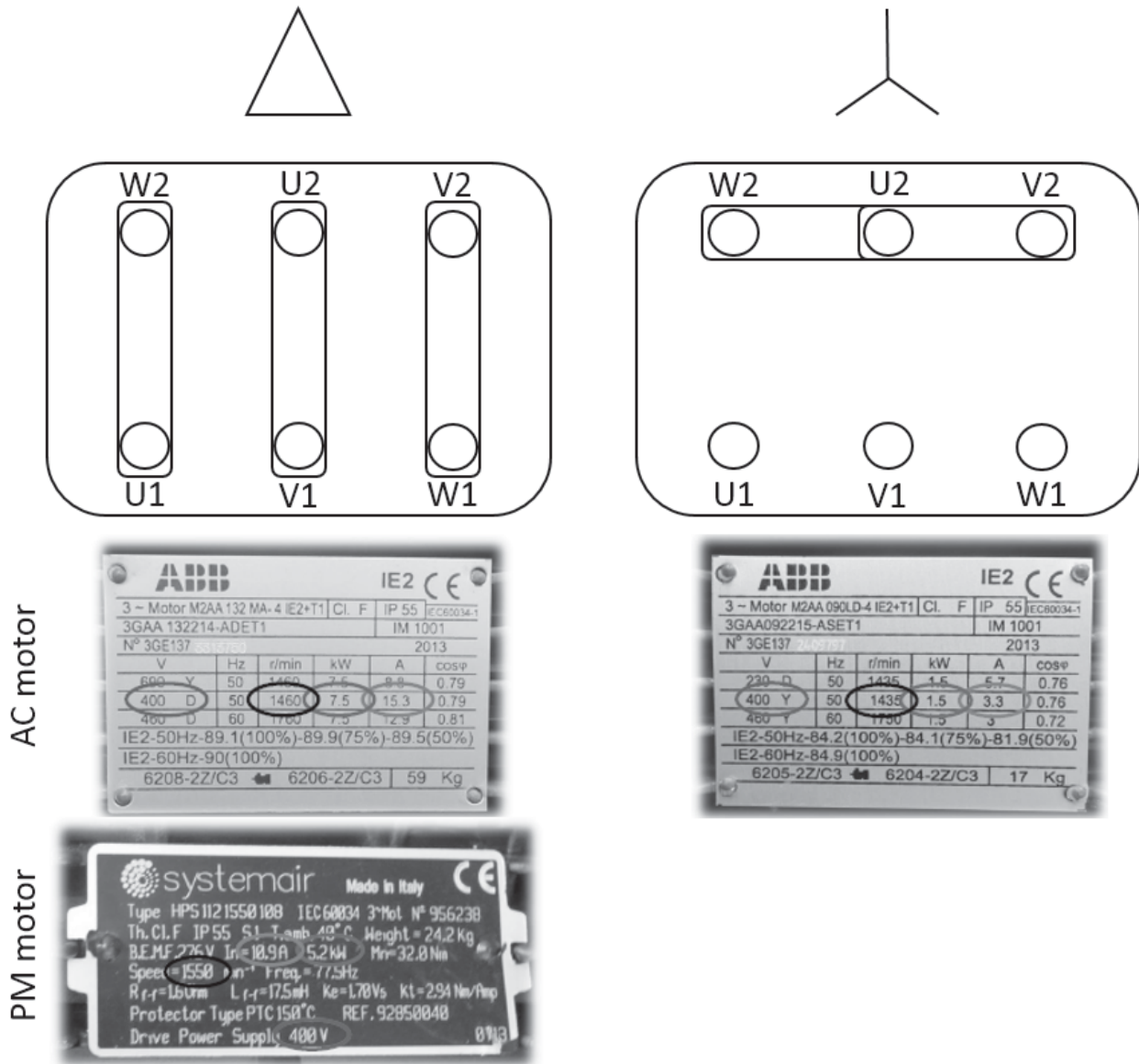
Menu for internal controller in the DVU-HP



Annex 12. Connection of fan motor and set-up for frekv. conv.

12.1 Connection of fan motor

Delta connection is shown to the left, and star connection is shown to the right.



12.2 Set-up for Danfoss FC101 for DV-units with AC motors

SETUP IS DONE IN FACTORY BEFORE DELIVERY

To reload Systemair factory settings from the control panel:

0-50: LCP Copy: [2]

Systemair factory set-up is based on Danfoss initialization.

14-22: Operation mode: [2] Initialisation (Danfoss Initialisation)
Turn power off and on.

Systemair factory set-up:

0-01: Language selection:

1-03: Torque characteristic: Single fan: [3] Auto-Energy optim.
With twin fan set-up: [1] Variable Torque

1-20: Motor Power: According to motor plate / order papers
With twin fan set-up total power must be used

1-24: Motor Current: According to motor plate / order papers
With twin fan set-up total current must be used

1-25: Motor Nominal Speed: According to motor plate / order papers

1-42: Motor Cable Length: 3m

1-50: Motor Magnetisation at zero speed.: 0 %

1-52: Min. Speed Normal Magnetisation: 10 Hz

1-73: Flying Start: [0] Disabled

1-90: Motor Thermal Protection: [2] Thermistor trip

3-15: Reference 1 Source: [2] Analog input AI54

1-93: Thermistor Source: [1] Analog input AI53

3-03: Maximum Reference: Max. Hz from order papers

3-16 + 3-17: Reference 2- and 3 Source: [0] No function

3-41 + 342: Ramp 1 up and down: 20 Sec.

4-19: Max. Output Frequency: 90Hz

4-14: Motor Speed High Limit: 90Hz

4-18: Current limit: 100 %

5-12: Terminal 27 Digital input: [0] No operation

5-40.0: Function Relay: [3] Drive ready/remote

5-40.1: Function Relay: [3] Drive ready/remote

6-25: Terminal 54 High Reference: Max. Hz from order papers

14-03: Over modulation: [1] Active

14-20: Reset Mode: [2] Automatic reset x 2

0-50: LCP Copy: [1] All to LCP (Copy of Systemair factory settings to panel)

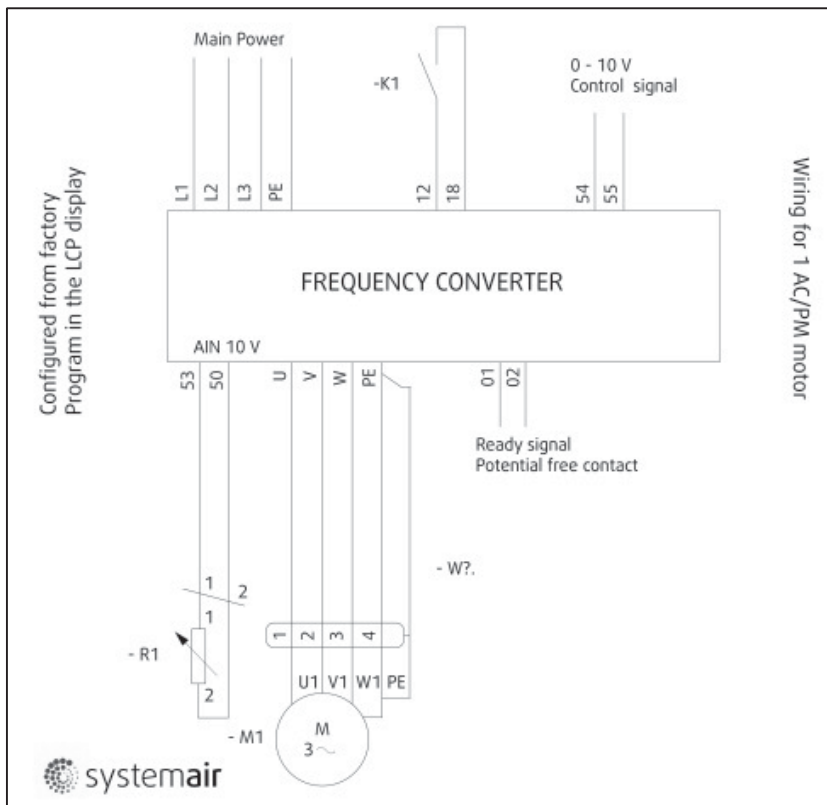
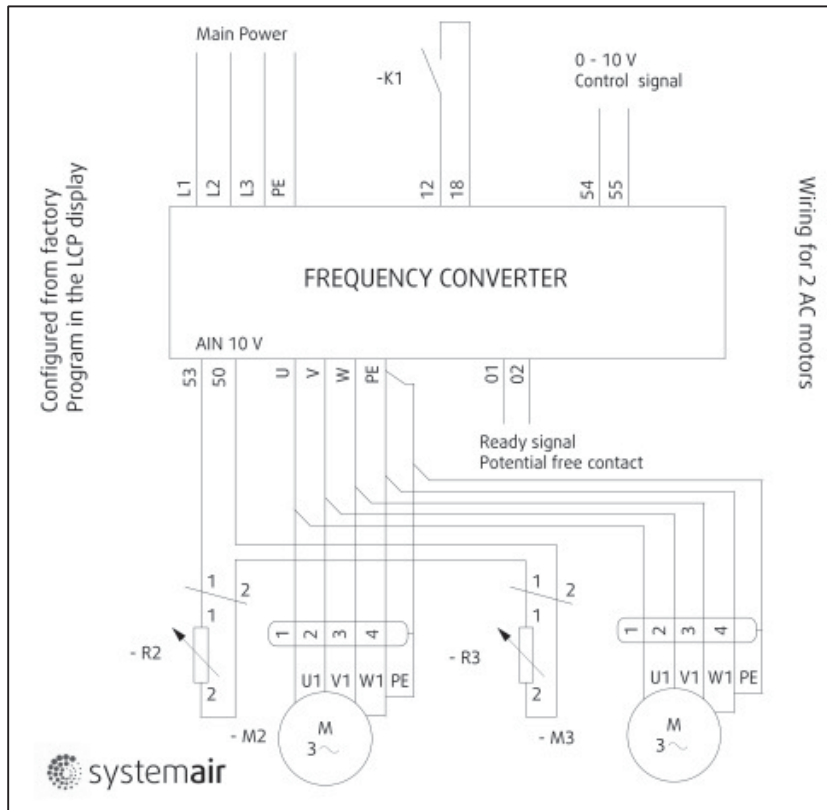
Connections:

0-10V: terminal 54-55

Start: terminal 12-18

Thermistor: terminal 50-53

Drive ready: terminal 1-2



12.3 AC-fan operation without thermistor for Danfoss FC101.

Systemair factory set-up is based on Danfoss initialization.

14-22: **Operation mode:** [2] Initialisation (Danfoss Initialisation)
Turn power off and on.

Systemair factory set-up:

0-01: Language selection:
1-03: **Torque characteristic:** [3] Auto-Energy optim.
1-20: **Motor power:** According to motor plate
1-24: **Motor Current:** According to motor plate
1-25: **Motor Nominal Speed:** According to motor plate
1-29: **Automatic motor adaption (AMA):** [1] Kompl.motor adaption to (Turn power off and on.)
1-42: **Motor Cable Length:** Order specific
1-50: **Motor Magnetisation at zero speed.:** 0 %
1-52: **Min. Speed Normal Magnetisation:** 10 Hz
1-73: **Flying start:** [0] Deactivated
5-40.0: **Function Relay:** [3] Drive ready/remote
14-03: **Over modulation:** [1] Active
14-20: **Reset Mode:** [2] Automatic reset x 2
0-50: **LCP Copy:** [1] All to LCP (Copy of Systemair factory settings to panel)

Connections:

0-10V: terminal 54-55

Start: terminal 12-18
Drive ready: terminal 1-2
Jumper terminal 12-27

12.4 Set-up Danfoss FC101 for DV-units with PM motors

SETUP IS DONE IN FACTORY BEFORE DELIVERY

To reload Systemair factory settings from the control panel:

0-50: LCP Copy: [2]

Systemair factory set-up is based on Danfoss initialization.

14-22: Operation mode: [2] Initialisation (Danfoss Initialisation)
Turn power off and on.

Systemair factory set-up:

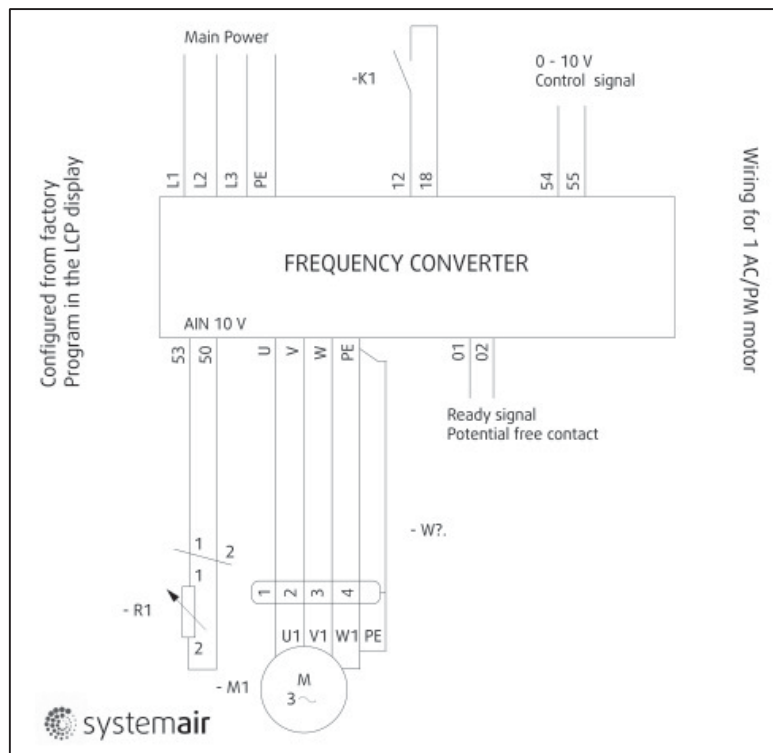
0-01: Language selection:
1-06: Clockwise Direction: [1] Inverse
1-10: Motor Construction: [1] PM, non-salient SPM
1-24: Motor Current: According to motor plate / Schedule
1-25: Motor Nominal Speed: According to motor plate / Schedule
1-26: Motor Cont. Rated torque: According to motor plate / Schedule
1-30: Stator Resistance (Rs): According to motor plate / Schedule
1-37: d-axis inductance (Ld): According to motor plate / Schedule
1-39: Motor Poles: According to motor plate / Schedule
1-40: Back EMF at 1000 RPM: According to motor plate / Schedule
1-42: Motor Cable Length: 3m
1-90: Motor Thermal Protection: [2] Thermistor trip
3-15: Reference 1 Source: [2] Analog input AI54
1-93: Thermistor Source: [1] Analog input AI53
3-03: Maximum Reference: According to motor plate / Schedule
3-16 + 3-17: Reference 2- and 3 Source: [0] No function
3-41 + 3-42: Ramp 1 Up and down: 30 sec.
4-19: Max. Output Frequency: According to motor plate / Schedule
4-14: Motor Speed High Limit: According to motor plate / Schedule
4-18: Current limit: 115 %
5-12: Terminal 27 Digital input: [0] No operation
5-40.0: Function Relay: [3] Drive ready/remote
5-40.1: Function Relay: [3] Drive ready/remote
6-25: Terminal 54 High Reference: According to motor plate / Schedule
14-03: Over modulation: [1] Active
14-20: Reset Mode: [2] Automatic reset x 2
0-50: LCP Copy: [1] All to LCP (Copy of Systemair factory settings to panel)

Connections:

0-10V: terminal 54-55
Start: terminal 12-18
Thermistor: terminal 50-53
Drive ready: terminal 1-2

Schedule for PM motor parameters

| Menu: | 124 | 125 | 126 | 130 | 137 | 139 | 140 | 303 + 625 | 414 + 419 |
|-------------------|----------------|-----------------|---------------|------------|-----------|-------|-------------|-----------|--------------|
| Motor Type Number | Amp Name plate | Motor RPM rated | Nm Name plate | Ohm [Rf-f] | mH [Lf-f] | Poles | Bemf @ 1000 | Max Hz | Max motor Hz |
| HPS 71 3800 18 | 1,8 | 3800 | 2 | 3,600 | 13,00 | 6 | 67 | 215 | 219 |
| HPS 71 3700 28 | 2,8 | 3700 | 3,6 | 1,580 | 6,10 | 6 | 79 | 191 | 204 |
| HPS 71 3300 18 | 1,8 | 3300 | 2,6 | 5,750 | 20,50 | 6 | 85 | 170 | 182 |
| HPS 71 3200 30 | 3 | 3200 | 4,2 | 1,850 | 7,25 | 6 | 84 | 161 | 176 |
| HPS 71 2900 21 | 2,1 | 2900 | 3,3 | 4,500 | 14,75 | 6 | 95 | 143 | 160 |
| HPS 71 2800 40 | 4 | 2800 | 6,14 | 1,675 | 6,75 | 6 | 95 | 144 | 154 |
| HPS 71 2500 29 | 2,9 | 2500 | 5 | 3,000 | 11,00 | 6 | 105 | 129 | 138 |
| HPS 71 2350 38 | 3,8 | 2350 | 7,3 | 2,300 | 9,35 | 6 | 115 | 120 | 129 |
| HPS 90 2650 64 | 6,4 | 2650 | 9,6 | 1,250 | 10,75 | 8 | 87 | 182 | 194 |
| HPS 90 2350 76 | 7,6 | 2350 | 13 | 0,800 | 10,00 | 8 | 103 | 159 | 172 |
| HPS 90 2100 63 | 6,3 | 2100 | 10,5 | 1,500 | 14,75 | 8 | 101 | 142 | 154 |
| HPS 90 2050 100 | 10 | 2050 | 19 | 0,810 | 8,75 | 8 | 115 | 140 | 150 |
| HPS 90 1850 84 | 8,4 | 1850 | 16 | 1,050 | 11,50 | 8 | 110 | 127 | 136 |
| HPS 90 1900 136 | 13,6 | 1900 | 26 | 0,575 | 7,25 | 8 | 110 | 127 | 139 |
| HPS 90 1700 106 | 11 | 1700 | 22 | 0,575 | 7,25 | 8 | 117 | 116 | 125 |
| HPS 112 1550 108 | 10,9 | 1550 | 32 | 0,750 | 8,75 | 6 | 178 | 80 | 85 |
| HPS 112 1700 145 | 14,5 | 1700 | 39 | 0,465 | 5,45 | 6 | 162 | 88 | 94 |
| HPS 112 1350 135 | 13,5 | 1350 | 44 | 0,490 | 6,45 | 6 | 197 | 69 | 74 |
| HPS 112 1500 187 | 18,7 | 1500 | 54 | 0,295 | 4,35 | 6 | 175 | 76 | 83 |
| HPS 112 1000 140 | 14 | 1000 | 51 | 0,475 | 7,00 | 6 | 242 | 54 | 55 |
| HPS 132 1250 199 | 19,9 | 1250 | 69 | 0,255 | 7,60 | 6 | 210 | 65 | 69 |
| HPS 132 1000 202 | 20,2 | 1000 | 77 | 0,315 | 9,25 | 6 | 230 | 51 | 65 |
| HPS 132 1150 300 | 30 | 1150 | 104 | 0,235 | 8,00 | 6 | 230 | 58 | 65 |
| HPS 132 930 273 | 27,3 | 930 | 118 | 0,280 | 9,75 | 6 | 261 | 46 | 65 |



Annex 13. Commissioning

See separate cover with annexes 1, 2, 3, 13 and 14

Annex 14. Test report

See separate cover with annexes 1, 2, 3, 13 and 14

Annex 15. Components

15.1 DV units delivered in several sections

This model of the DV unit has an integrated control system and depending on the size of the unit, the cabinet is installed on the unit or on the front of the unit. The 2 controllers - Systemair E28-2 port controller and a Systemair E28 expansion - both controllers are mounted in the cabinet, and all electrical connections between cabinet and components in the unit are installed. The control system is configured according to the customer's order – confirmed by the order confirmation - to promote easy start-up on the site. The unit is tested at the factory and all functions are confirmed by a final functional test and test report. The test report is annex 14 for the User Manual. After the final test the unit is divided in sections to facilitate the transport. After reassembly of the unit on the site, the clearly marked cables with sockets must be reconnected in the marked cabinet terminals. Cable strips are preinstalled for installation of the cables between the components in the unit-sections and the cabinet. Cables installed on the unit-sections in the preinstalled strips are protected by metal covers. The covers have been removed before installation of the unit on the final site and must be replaced after installation of the cables. Cables with the mains power supply must be installed in the automatic circuit breakers belonging to fans, cooling compressor unit DVU (if delivered) and cooling compressor unit with rotary heat exchanger – DVU-C (if delivered). All external components must be connected on the site.

External components

External components are Systemair Control Panel, valves, valve motors, pressure transmitters, supply air temperature sensor, sensor for water temperature in the heating coil (if water heating coil was requested) and circulation pump (Systemair does not deliver the pump). Terminals are present in the cabinet for pressure transmitters, if it is a solution for constant pressure in the ducts, and terminals are present in the cabinet for valve motors, circulation pump, supply air temperature sensor and sensor for water temperature in the heating coil, but cables are not installed and not connected to terminals in the cabinet. The Systemair Control Panel with 10 meters of cable is not connected to the controller in the cabinet. All external components delivered are packed in a cardboard box delivered together with the unit.

15.2 DV unit delivered assembled on base frame

This model of the DV unit has an integrated control system and the cabinet mounted inside the unit. The cabinet is always mounted in the unit section with the heat exchanger and the cabinet is always placed at the warm side of the heat exchanger. The intelligent controllers – Systemair E28-2 port controller and a Systemair E28 expansion - both controllers are mounted in the cabinet, and all electrical connections between cabinet and components in the unit are installed. The control system is configured according to the customer's order – confirmed by the order confirmation - to promote easy start-up on the site. The unit is tested at the factory and all functions are confirmed by a final functional test and test report. The test report is annex 14 for the User Manual. The unit is delivered as one assembled section on base frame. Cables with the mains power supply must be installed in the automatic circuit breakers belonging to fans, cooling compressor unit DVU (if delivered) and cooling compressor unit with rotary heat exchanger – DVU-C (if delivered). All external components must be connected on the site.

External components

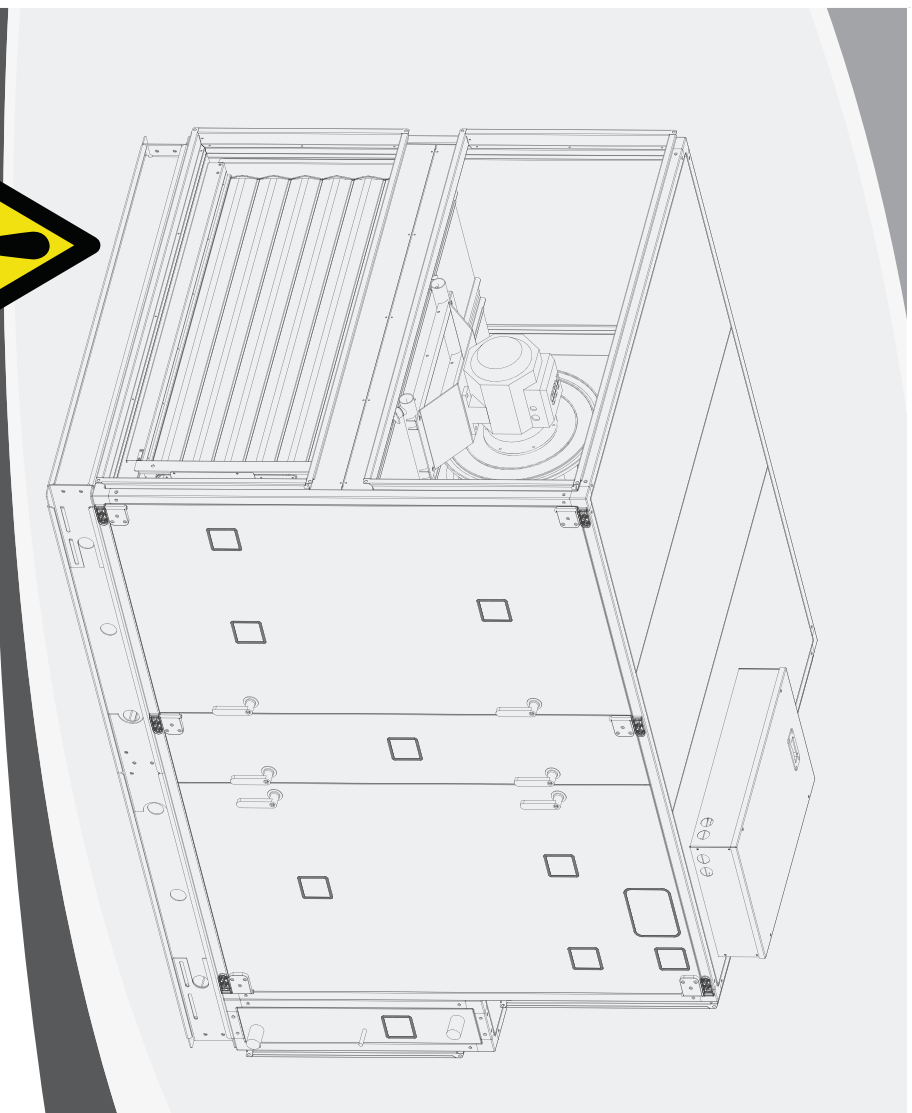
External components are Systemair Control Panel, valves, valve motors, pressure transmitters, supply air temperature sensor, sensor for water temperature in the heating coil (if water heating coil was requested) and circulation pump (Systemair does not deliver the pump). Terminals are present in the cabinet for pressure transmitters, if it is a solution for constant pressure in the ducts, and terminals are present in the cabinet for valve motors, circulation pump, supply air temperature sensor and sensor for water temperature in the heating coil, but cables are not installed and not connected to terminals in the cabinet. The Systemair Control Panel with 10 meters of cable is not connected to the controller in the cabinet. All external components delivered are packed in a cardboard box delivered together with the unit.

Annex 16. Wiring diagram

See below

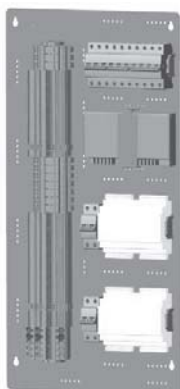
Danvent DV

Annex 16 - Wiring diagrams



PDF file is listed as follows:

| | |
|---------------------|---------|
| General description | 1 - 9 |
| Circuit diagram | 10 - 44 |
| Switchboard layout | 45 - 49 |
| Terminal matrix | 60 - 69 |
| Cable plan | 70 - 99 |



supplier:

Systemair A/S, Denmark
Ved Milepælen 7
8361 Hasselager

Bilag 16

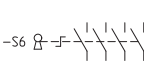
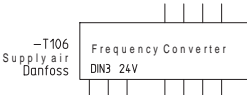
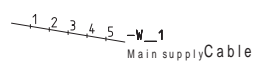




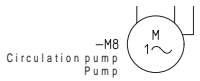
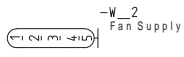



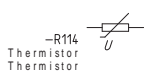

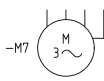

Units with external cabinet:
DV 10-40 are placed on top of the unit.
DV 50-240 are placed on front of the unit

Units with internal cabinet:
Cabinet is always inside the unit.


Components according to functions
are mark with **

| | | | | | | | | |
|--|--|---------------------------|----------------------------|------|-----------------------|--------------------------------|-----------------|---------------|
|  | | General Description Pages | Project: DV Control system | | Function description: | | Sheet: 1 | Next sheet: 2 |
| | | | Date: 30-04-2012 | Rev: | Init.: KAJU | Drawing no.: 43000001;43000002 | Total sheets: 5 | |

Symbols are according to IEC 60617.
On the following 2 pages there are descriptions of used symbols in the project.


| | | | |
|---|----------------------------|--|---------------------|
|  | Switchgear, 4 pole |  | Frequency converter |
|  | Main supplyCable |  | References |
|  | Automatic tripping, 3-pole |  | Terminal |
|  | Automatic tripping, 2-pole |  | Cirkulation pump |
|  | Shielded cable |  | Lamp |
|  | Resistor |  | Info text |
|  | Thermistor |  | Fuse |
|  | Motor three phase + PE |  | Transformer |

Symbols are according to IEC 60617.
These pages are descriptions of used symbols in the project.



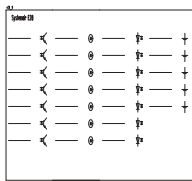
-K7_2

Relay contacts, normally open




-S7
Light

Switchgear



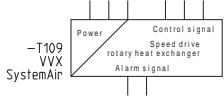
Corrigo E28

Corrigo E28




-M9
Supply air
Belimo

Damper motor




-T109
VVX
SystemAir

Rotary heat exchanger




-K8
Omron

Relay



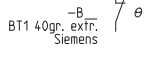
-S E
Extended operation
Eksternal

Switchgear




-B
GP1 Extract air
Regin

Switchgear




-B
BT1 40gr. extr.
Siemens

fireguard




-R
Pt1000

Temperature (measuring)



-P

Pressure



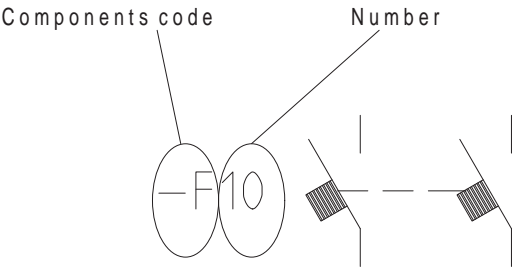
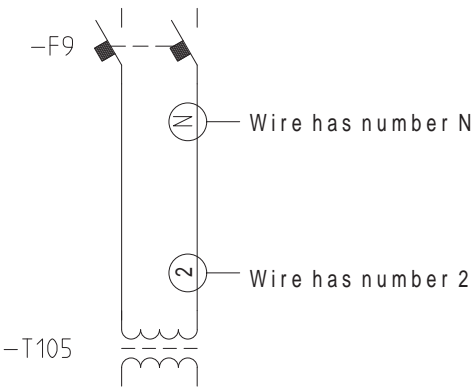
-M9
Supply air
Belimo

Plate exchanger dampermotor

| | | | | | | | |
|--|--|-----------------------------|----------------------------|------|---|-----------------|---------------|
|  | | General Description Symbols | Project: DV Control system | | Function description: | Sheet: 3 | Next sheet: 4 |
| | | | Date: 30-04-2012 | Rev: | Init.: KAJU Drawing no.: 43000001;43000002 | Total sheets: 5 | |

Labeling of wires
Cables are marked with
terminal name

Components are marked with component codes
followed by a number according to IEC 61346-1 Chart 1



General Description Wires

| | | | | | | | |
|------------------|--|-----------------------|--|-------------|--------------------------------|-------------|-----------------|
| Project: | | Function description: | | Sheet: | 4 | Next sheet: | 5 |
| Date: 30-04-2012 | | Rev.: | | Init.: KAJU | Drawing no.: 43000001;43000002 | | Total sheets: 5 |

Component codes used in the project

S = switchgear
F = automatic tripping
M = pump / Damper motor / valve motor
R = temperature sensors
T = VLT Converter / transformer
P = lamps
C = controller
B = fire guard / pressure guard / pressure transducer
W = cables
K = relay coils
X = terminal
U = cabinet

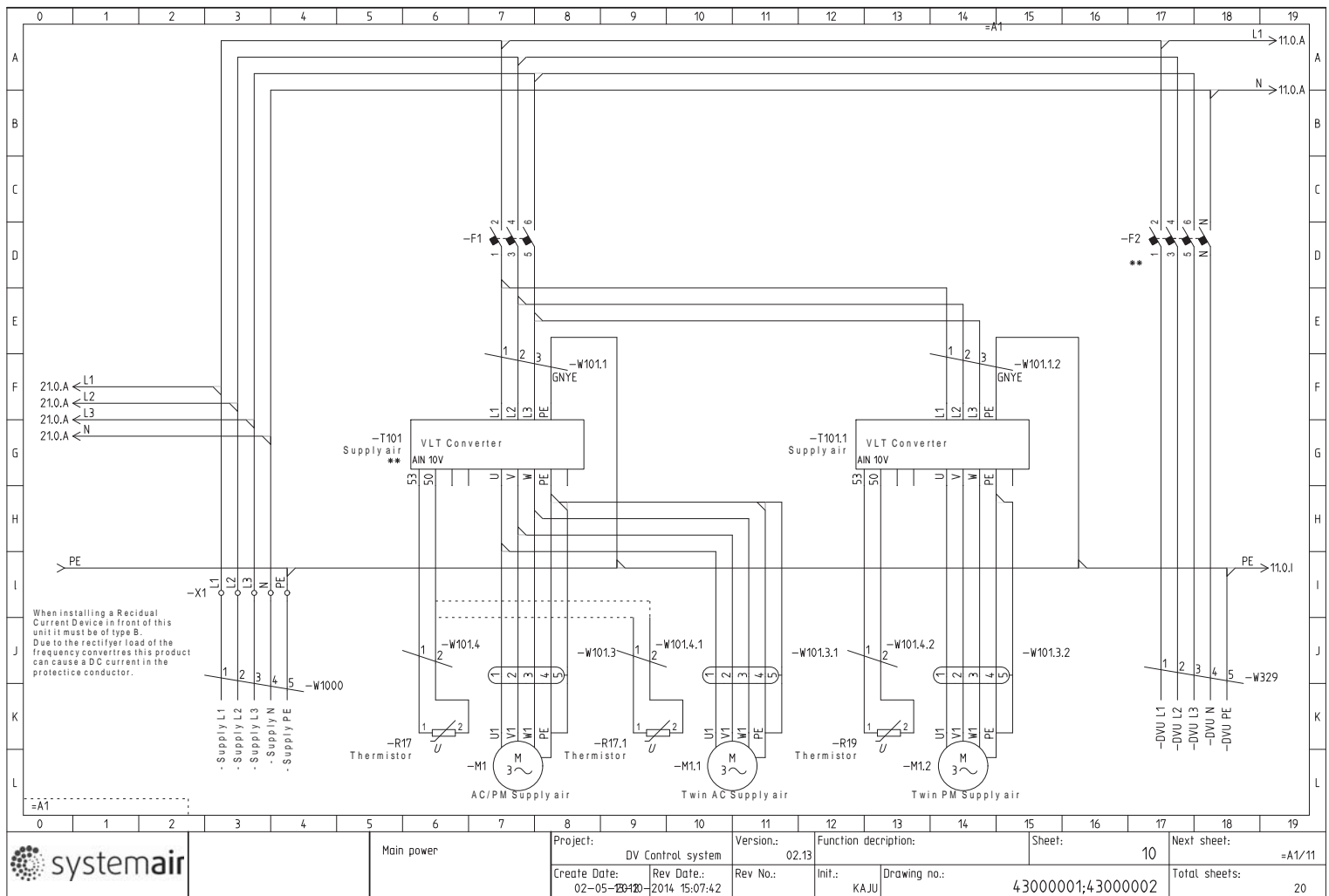
Data for the unit

Max load look in order paper

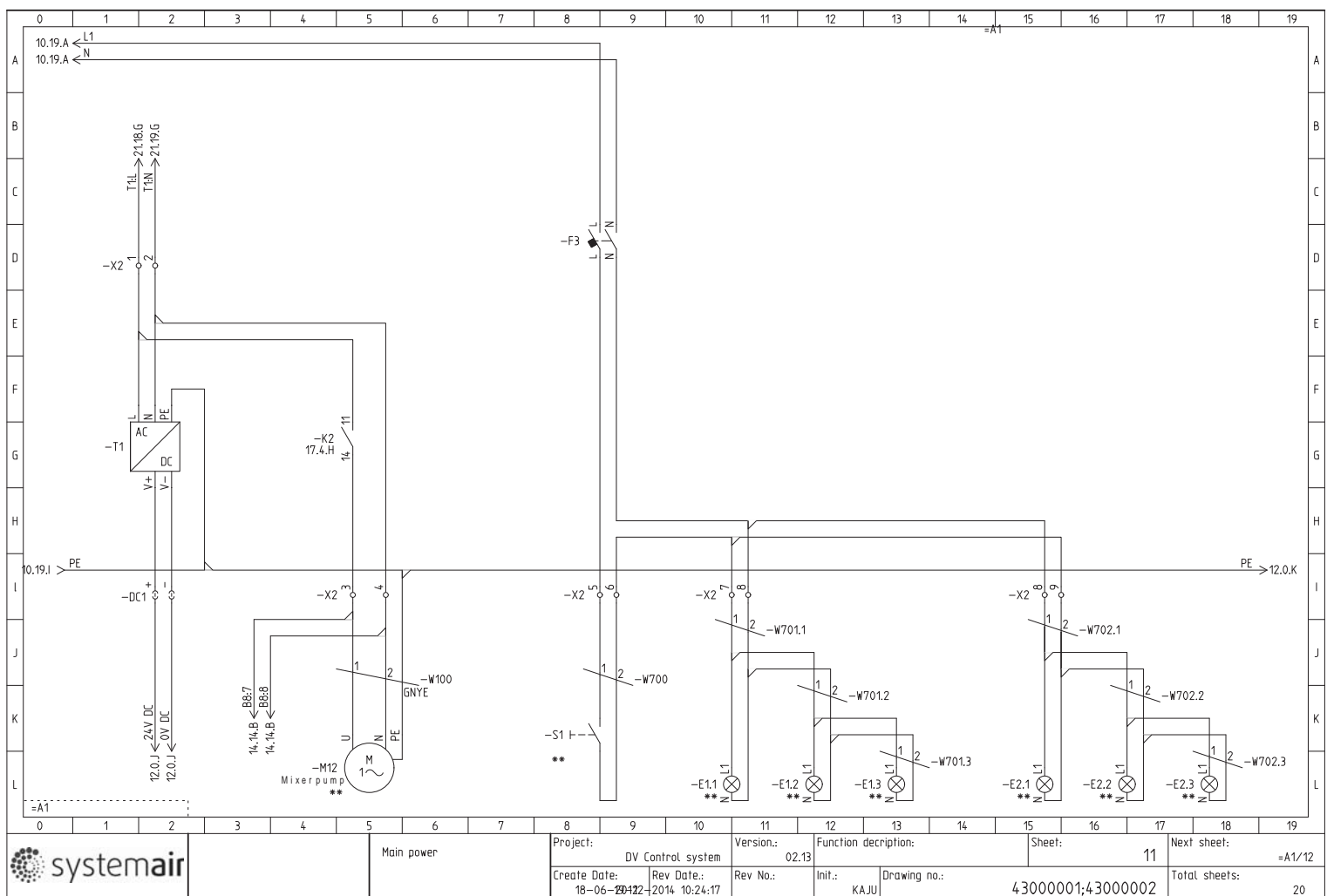
Max pre-fuse look in order paper

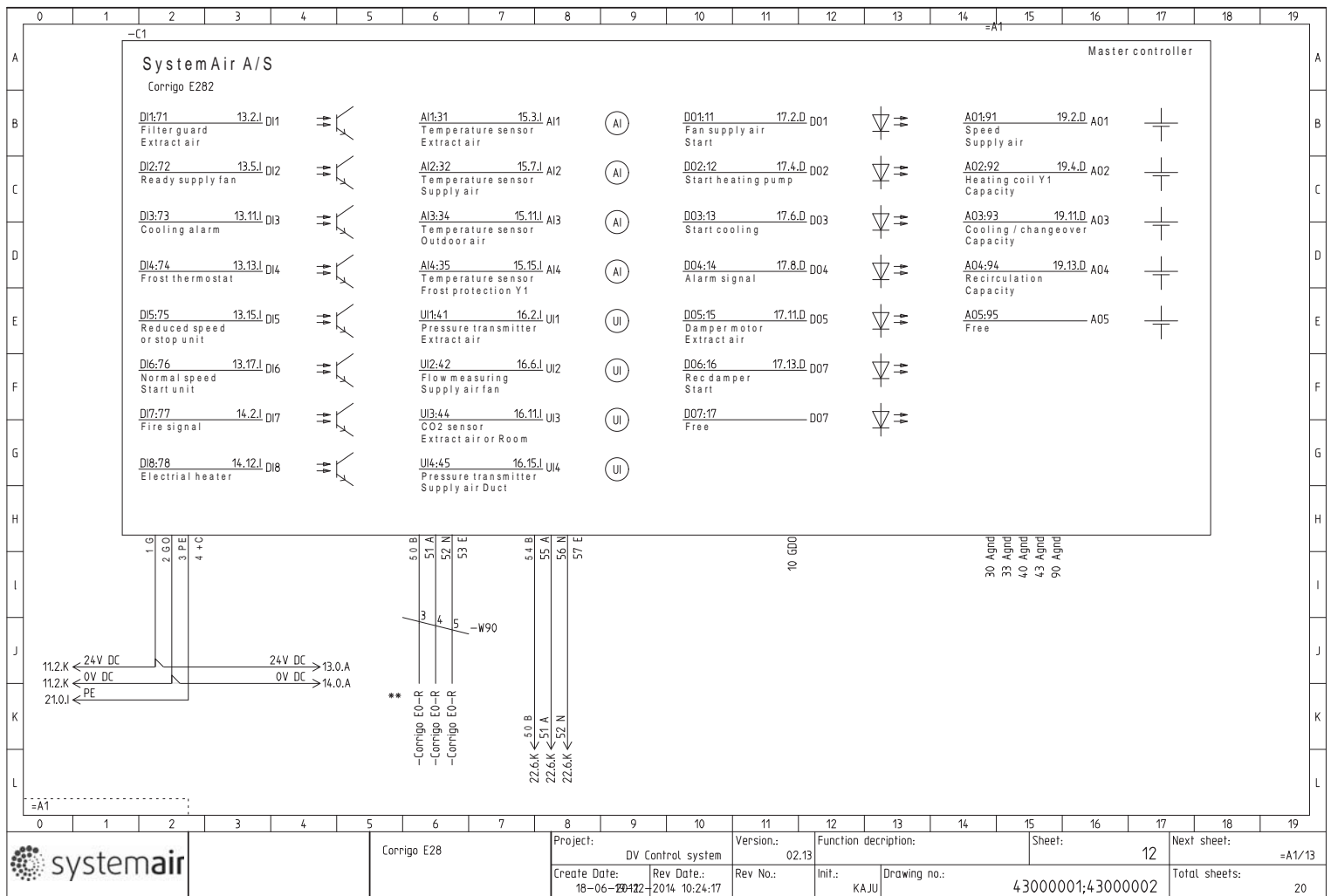
Ik max. 16kAmp

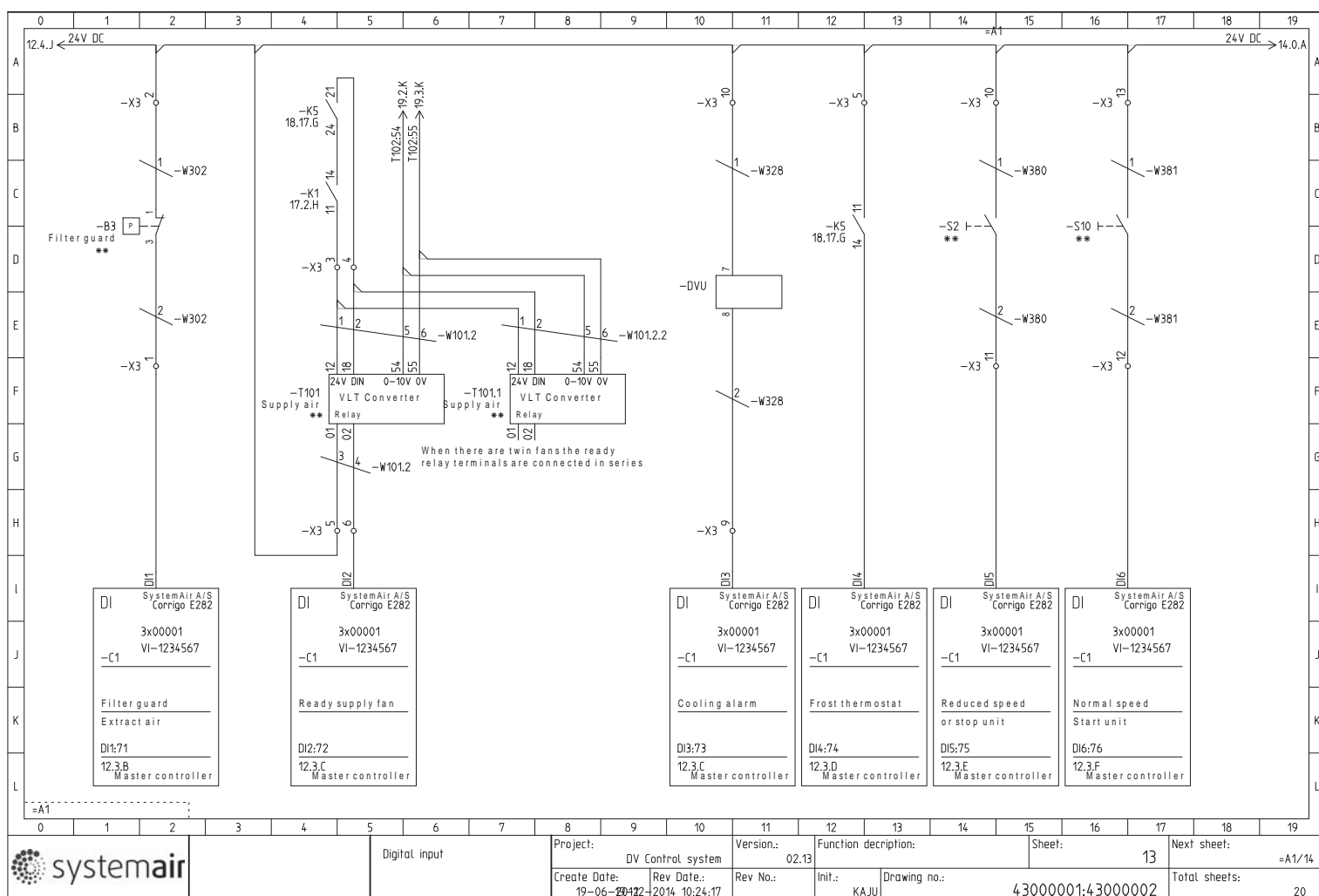
RCD type B

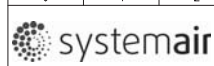
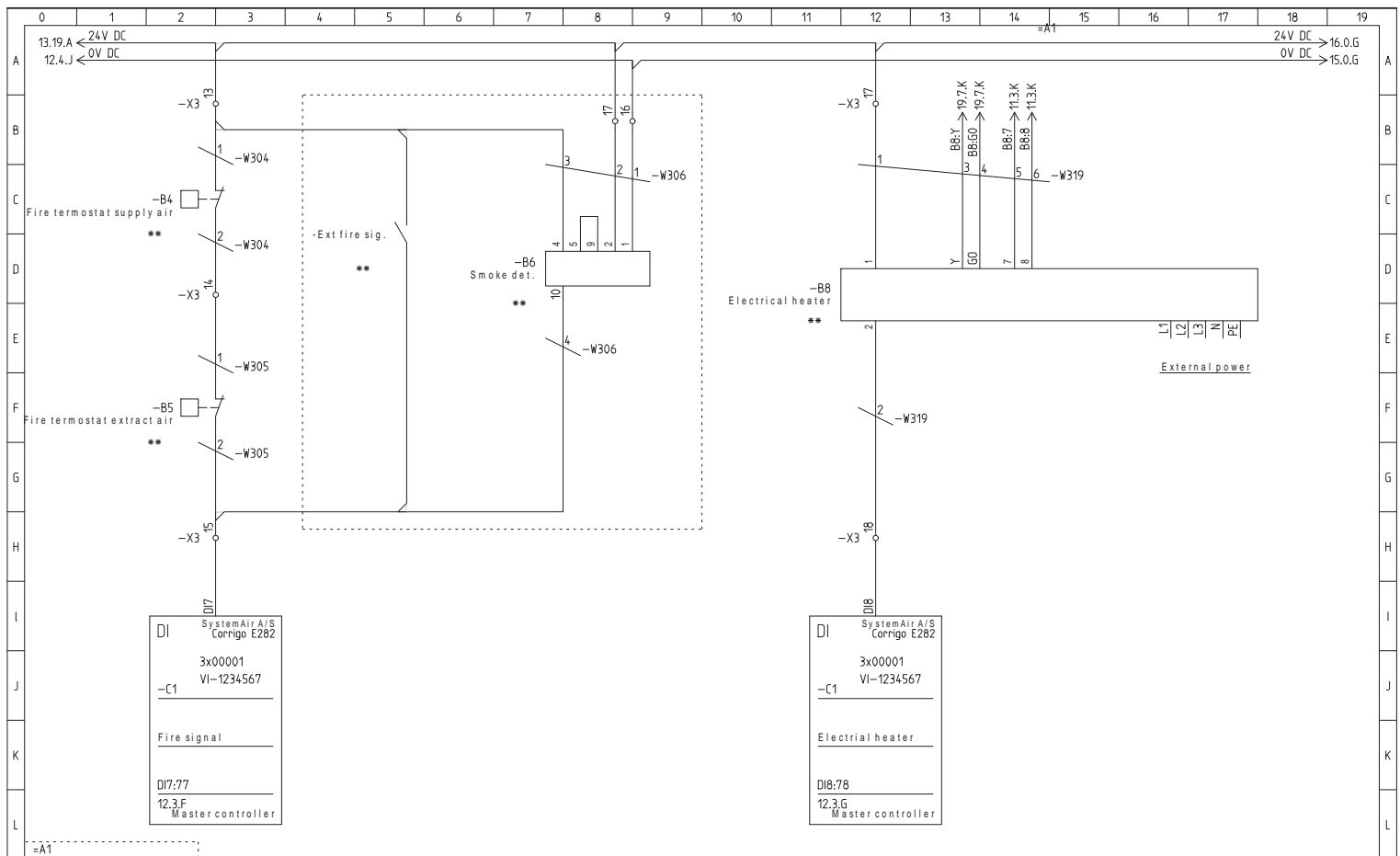


| | | | | | | |
|--|------------|----------------------------------|-------------------------------|-----------------------|--------------------------------|--------------------|
| | Main power | Project: DV Control system | Version: 02.13 | Function description: | Sheet: 10 | Next sheet: =A1/11 |
| | | Create Date: 02-05-2014 15:07:42 | Rev Date: 02-05-2014 15:07:42 | Rev No.: KAJU | Drawing no.: 43000001;43000002 | Total sheets: 20 |



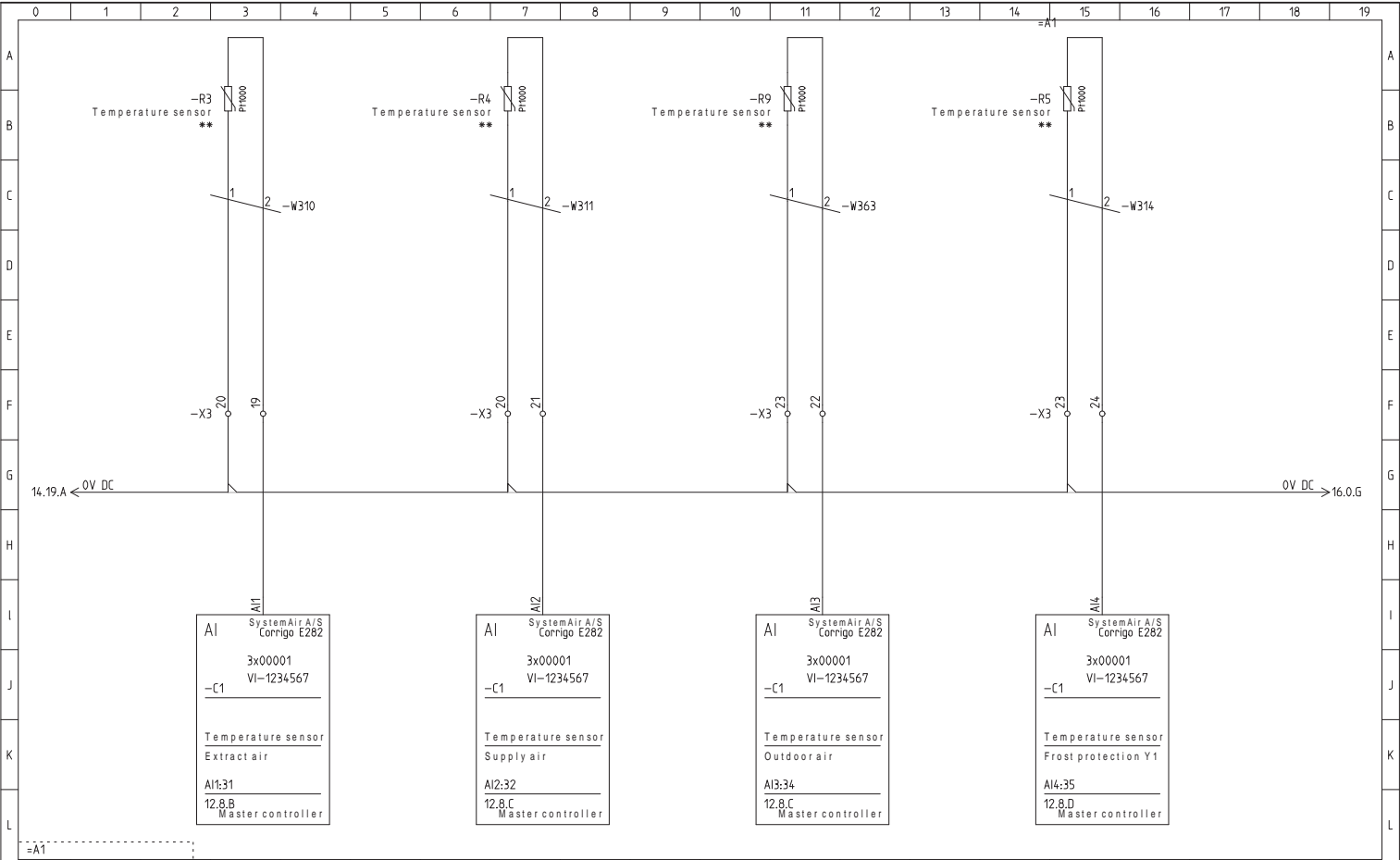






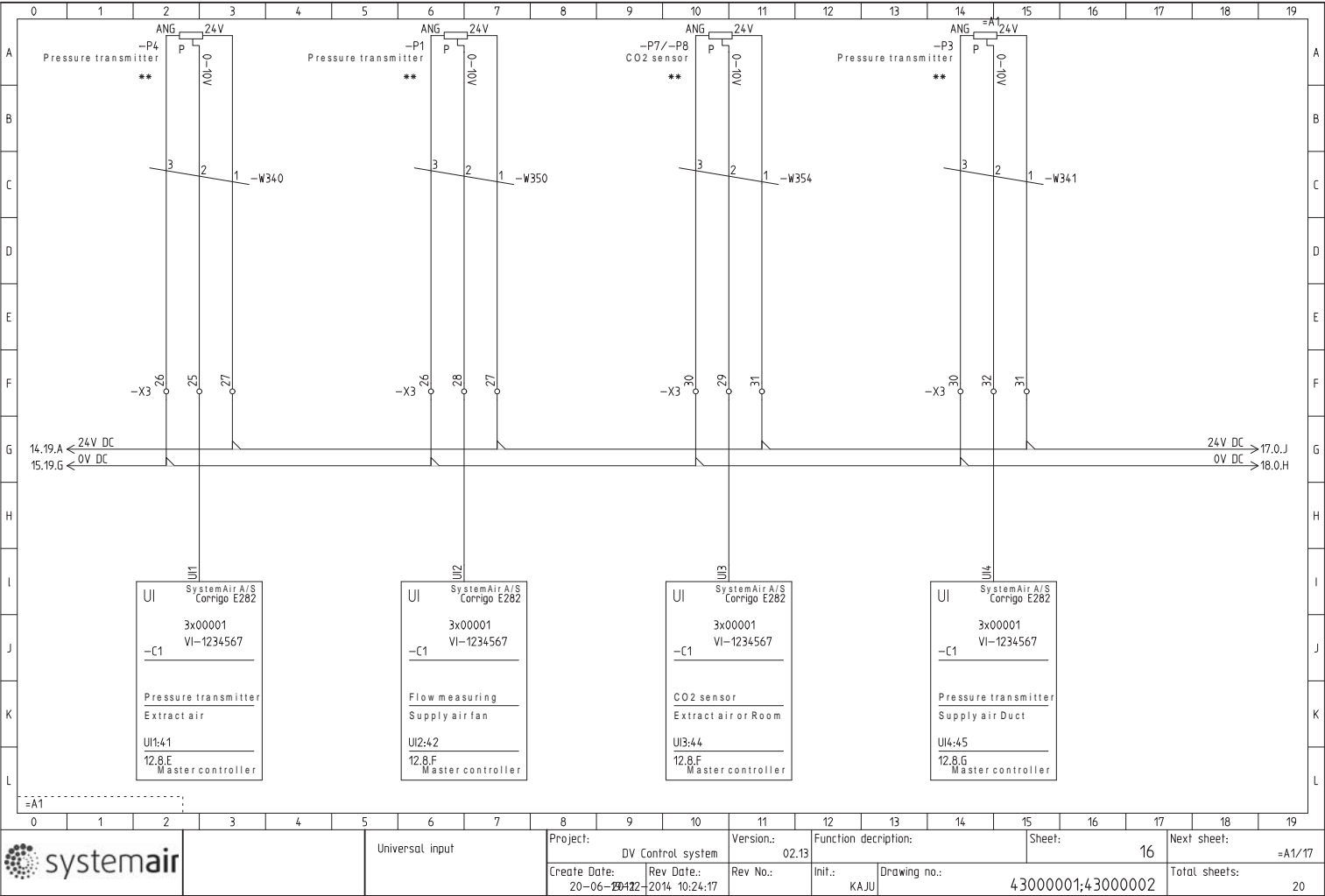
Digital input

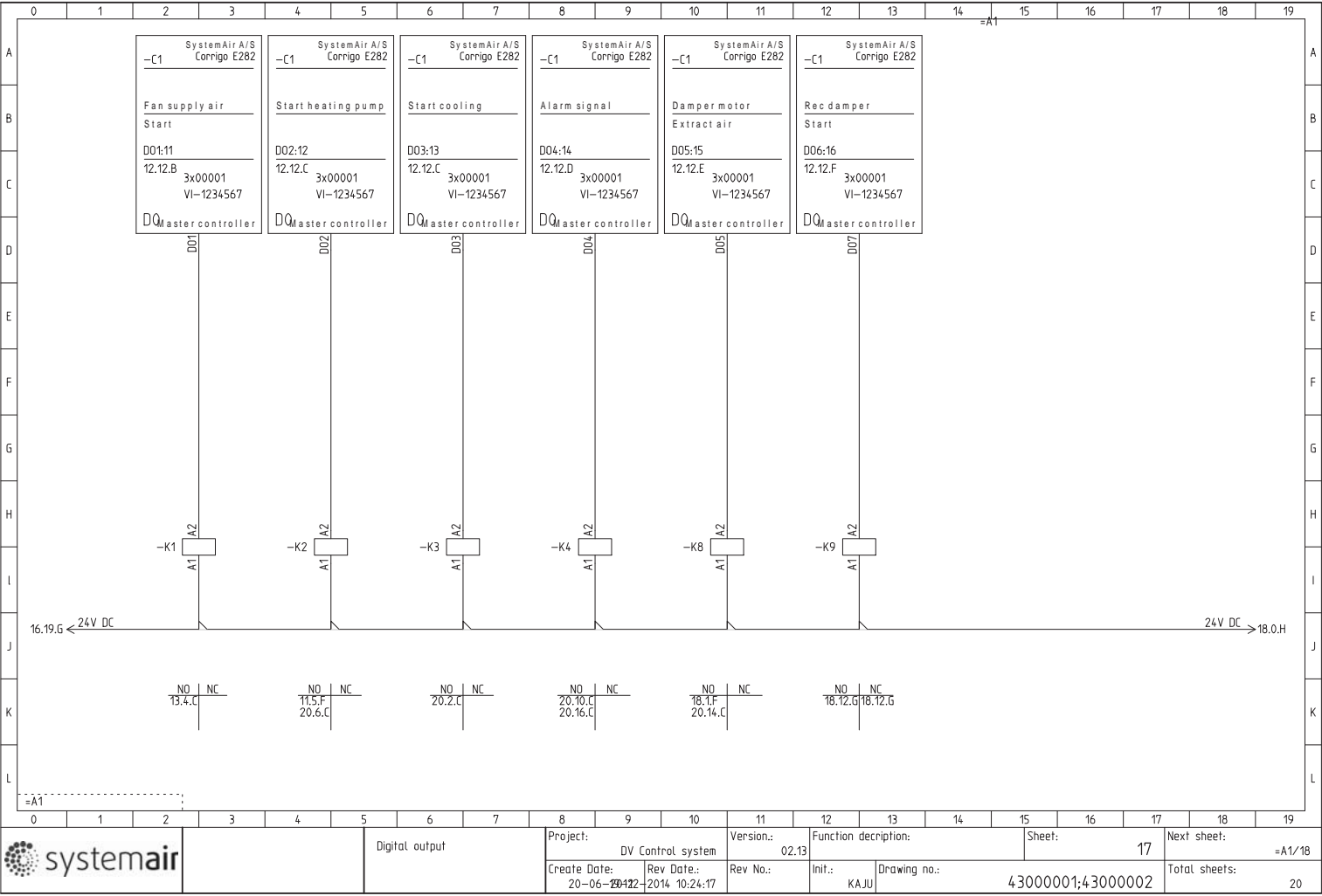
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|--------------|-------------------|-----------|----------|-----------------------|--------|------|---------------|-------------------|
| Project: | DV Control system | Version: | 02.13 | Function description: | Sheet: | 14 | Next sheet: | =A1/15 |
| Create Date: | 19-06-2014 | Rev Date: | 10:24:17 | Rev No.: | Init.: | KAJU | Drawing no.: | 43000001;43000002 |
| | | | | | | | Total sheets: | 20 |

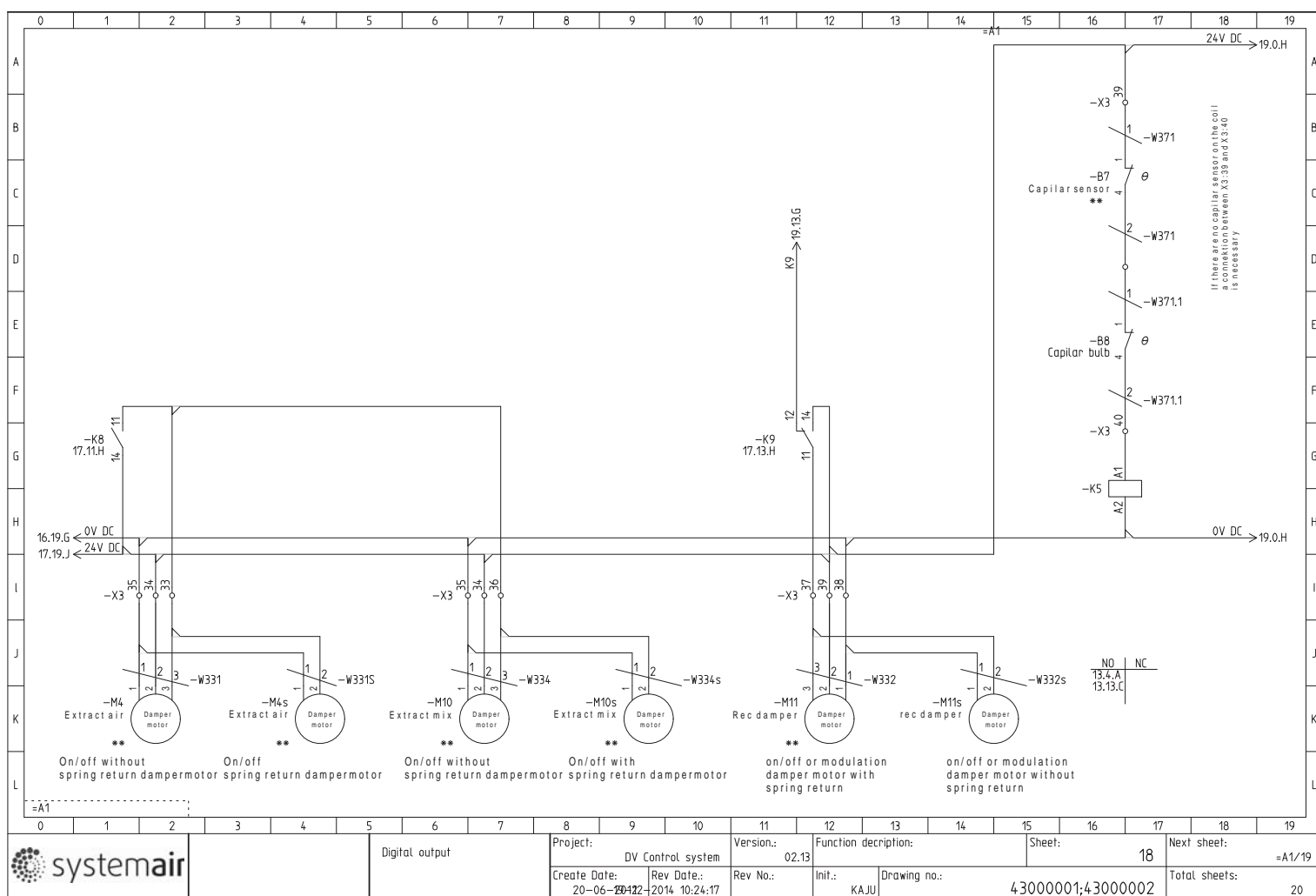


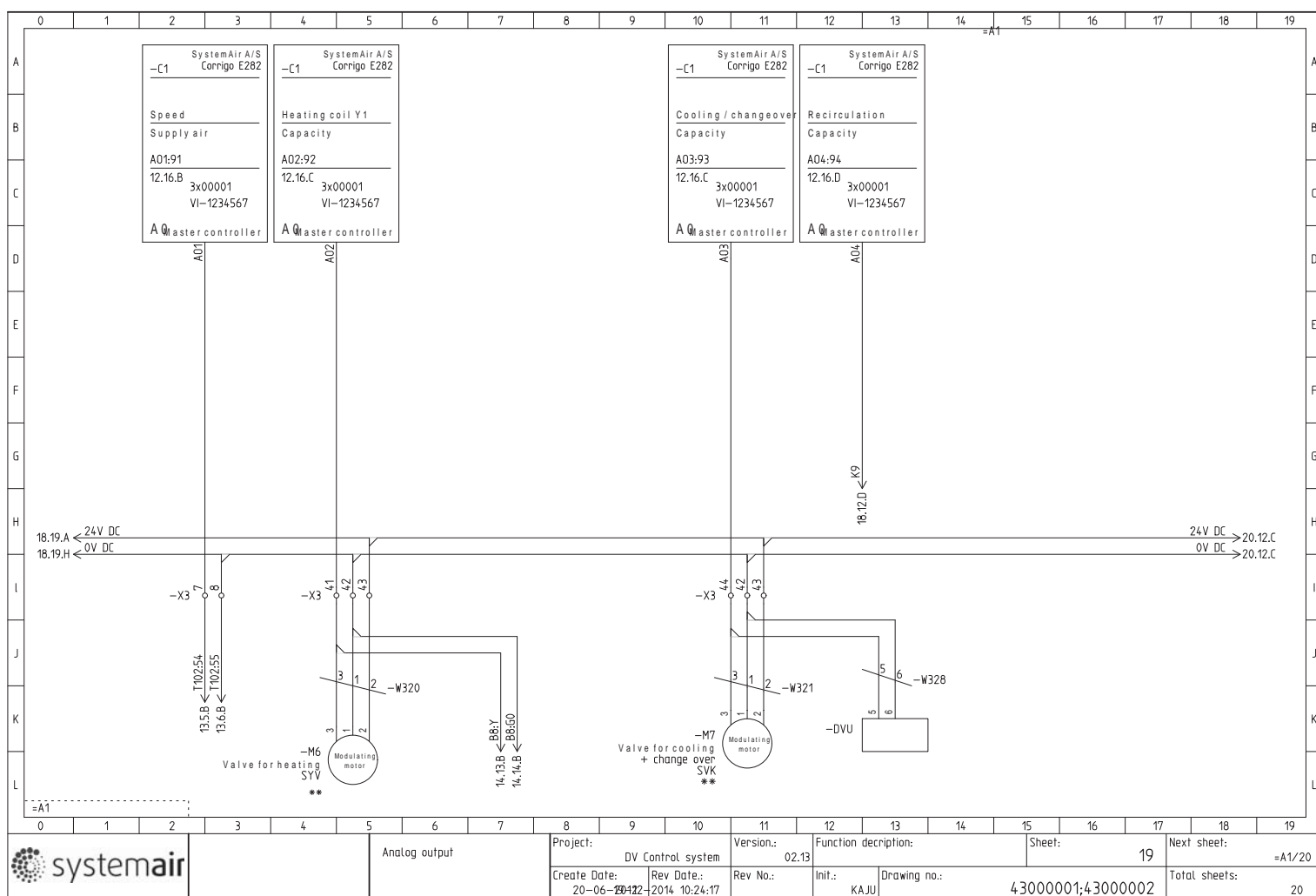
Analog input

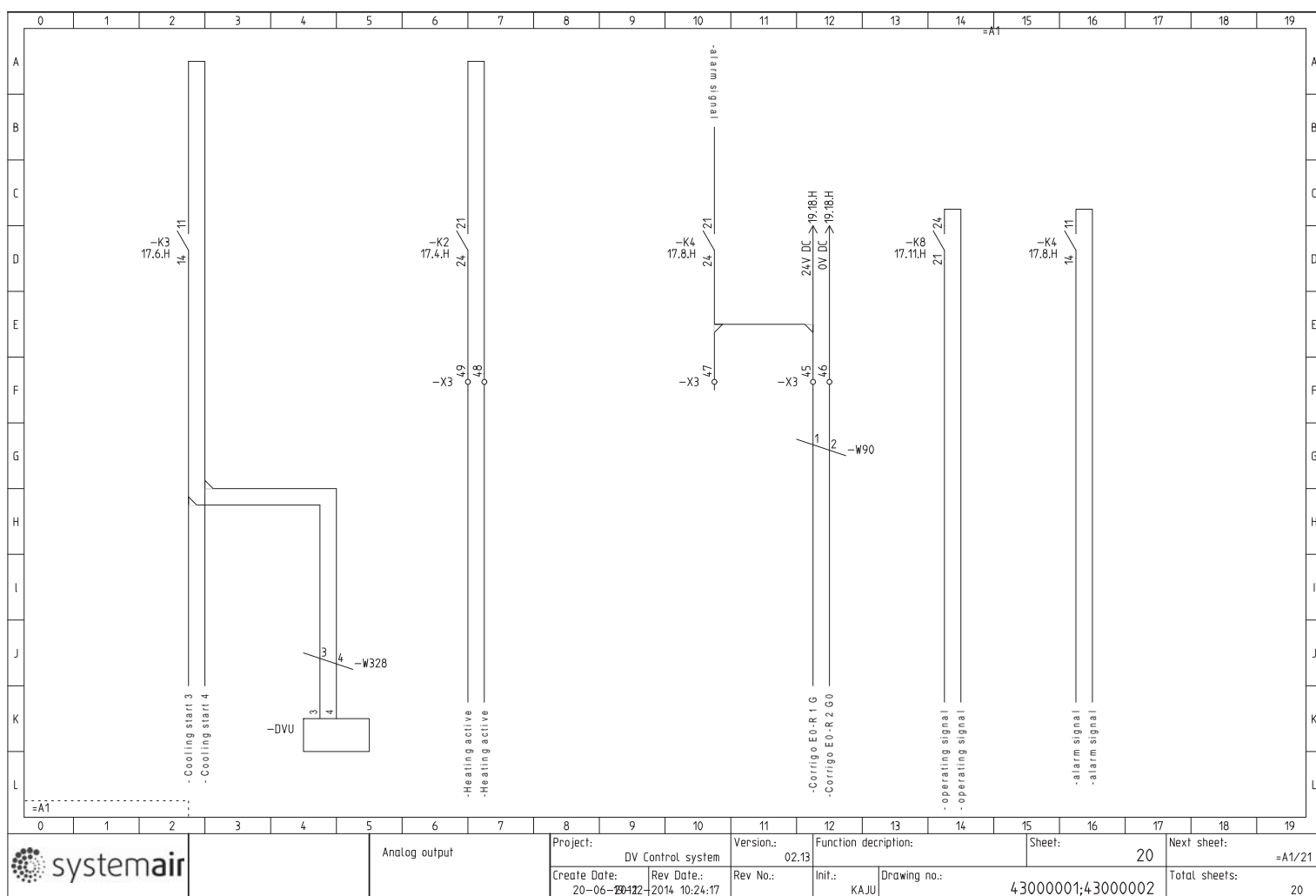
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|----------------------------|--------------------------|-----------------|-----------------------|--------------------------------|------------------|--------------------|
| Project: DV Control system | | Version.: 02.13 | Function description: | | Sheet: 15 | Next sheet: =A1/16 |
| Create Date: 20-06-2012 | Rev Date.: 2014 10:24:17 | Rev No.: | Init.: KAJU | Drawing no.: 43000001;43000002 | Total sheets: 20 | |

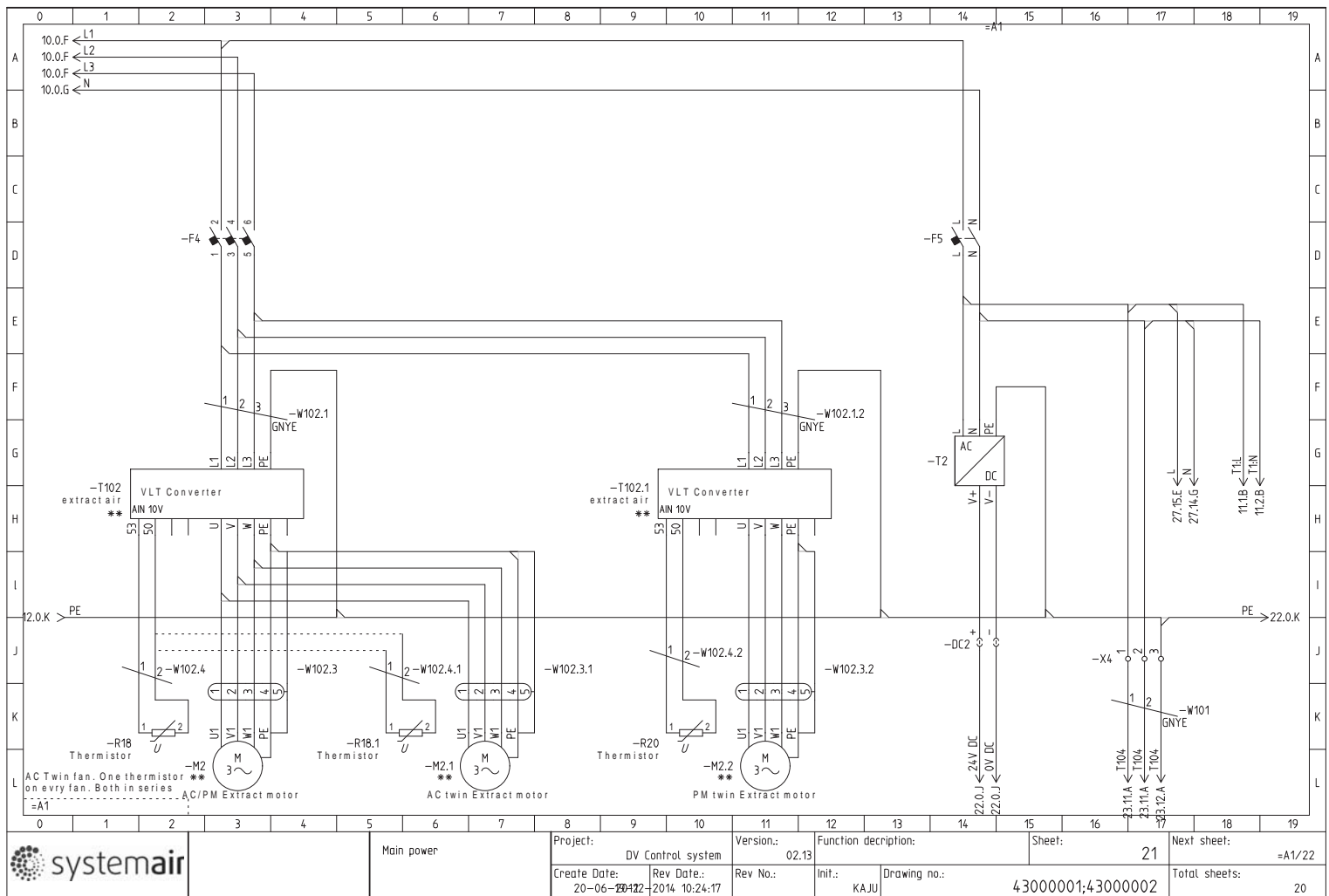


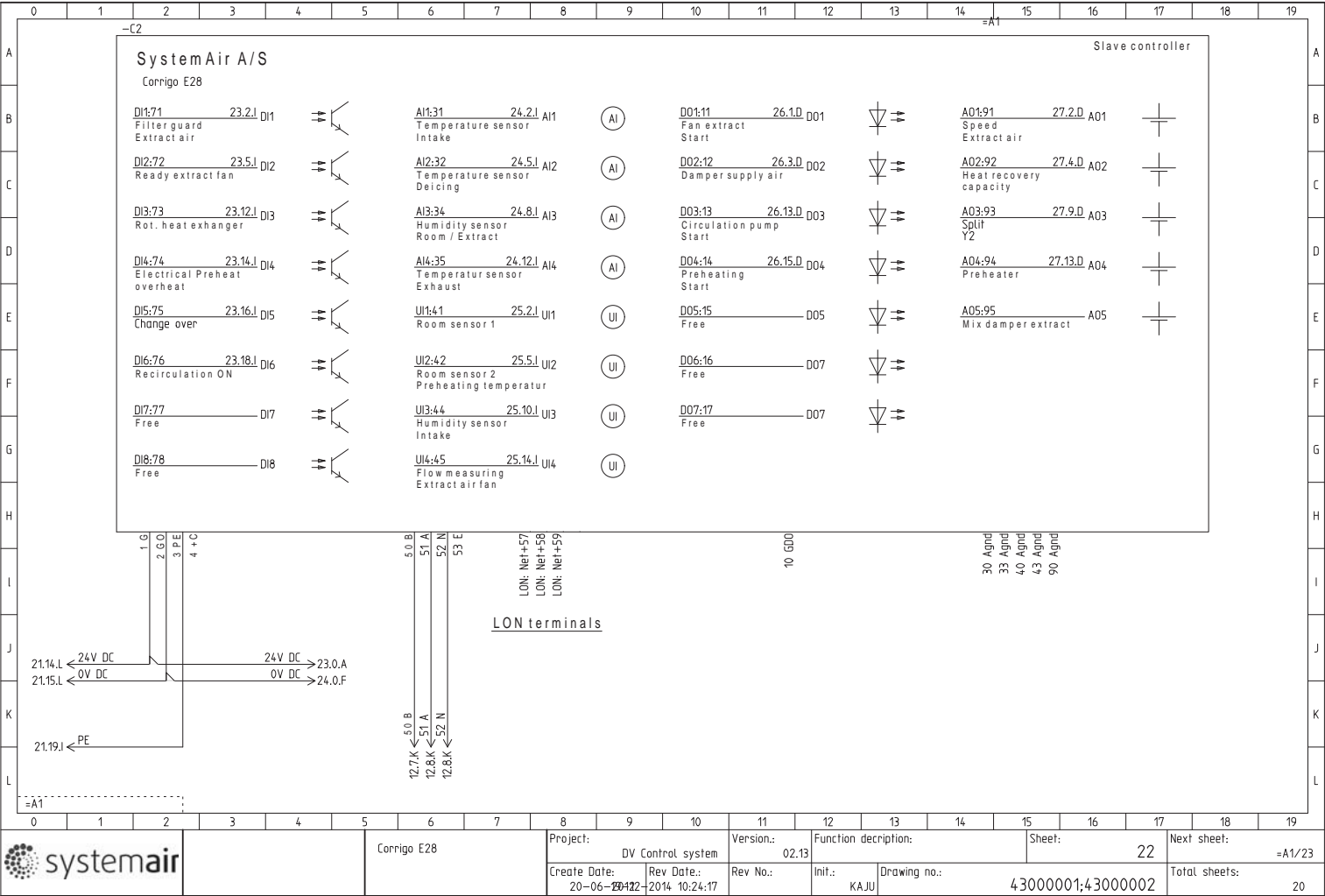


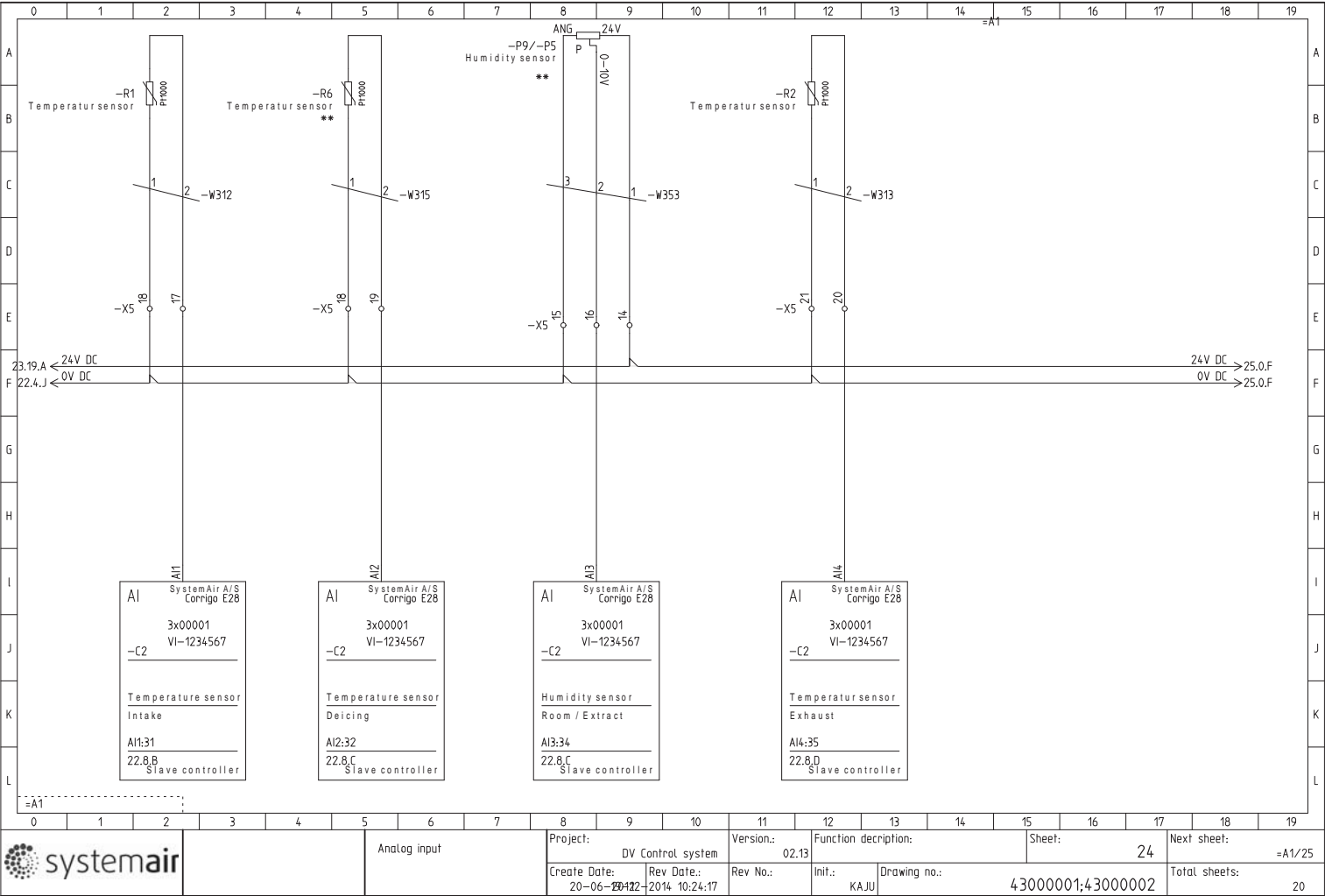


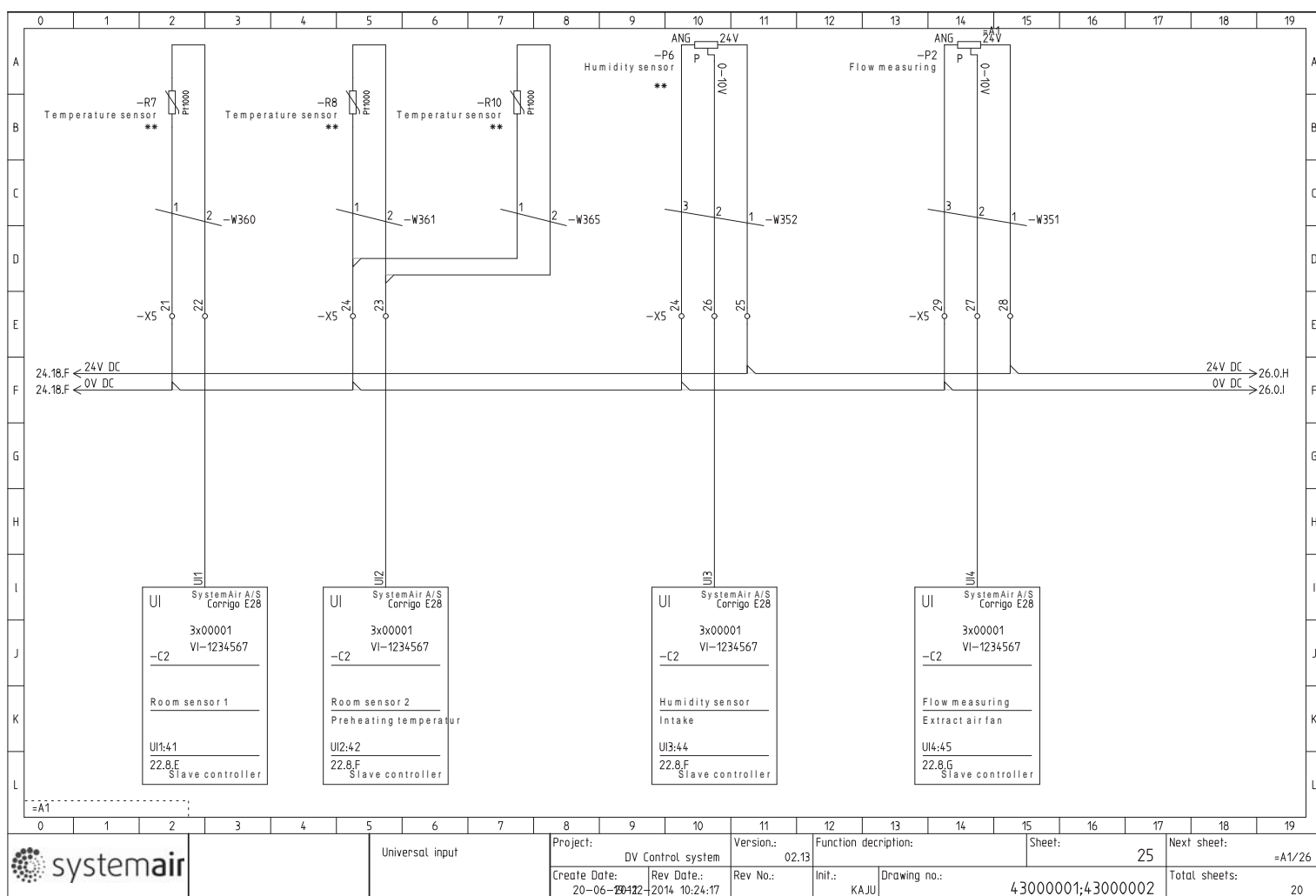


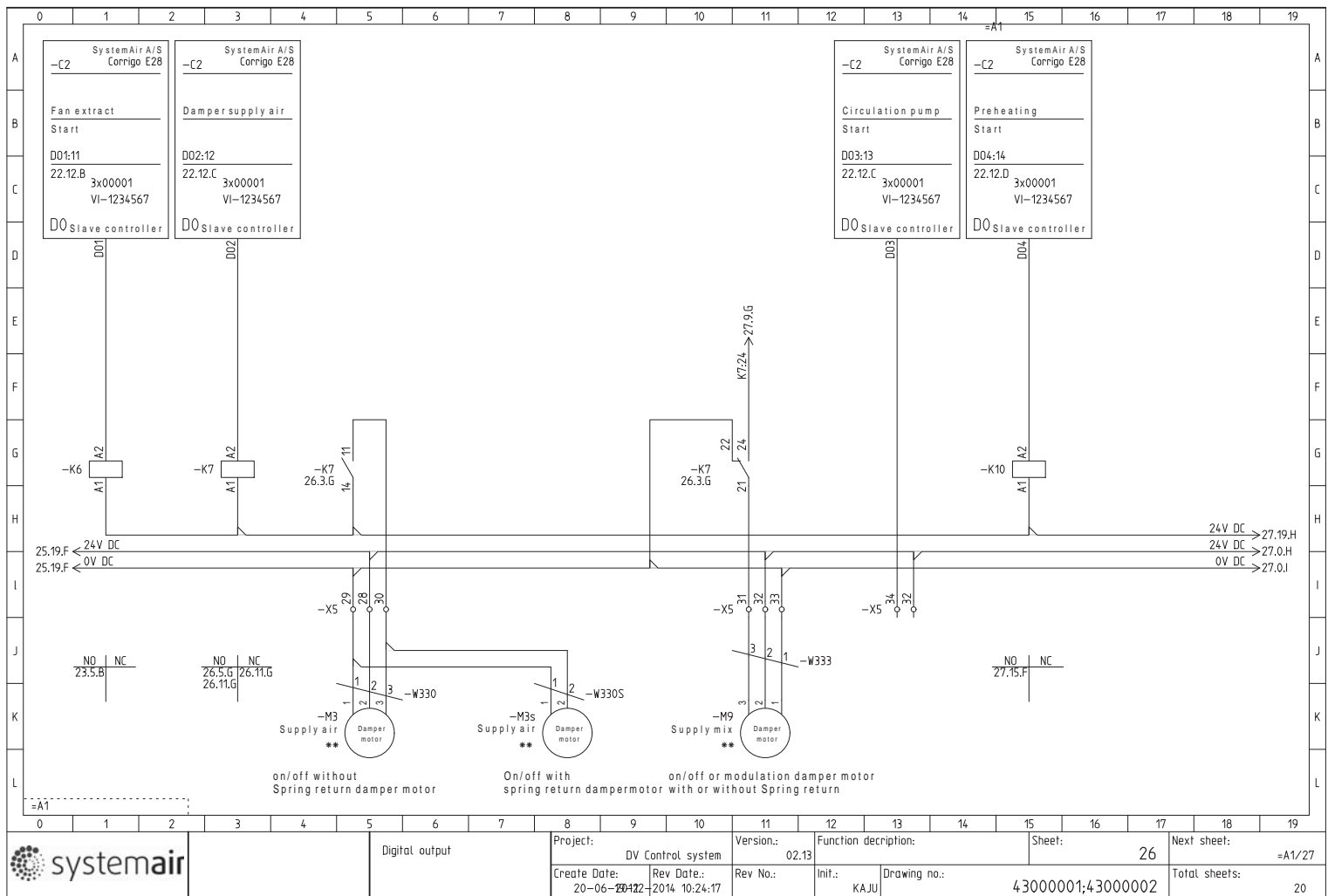


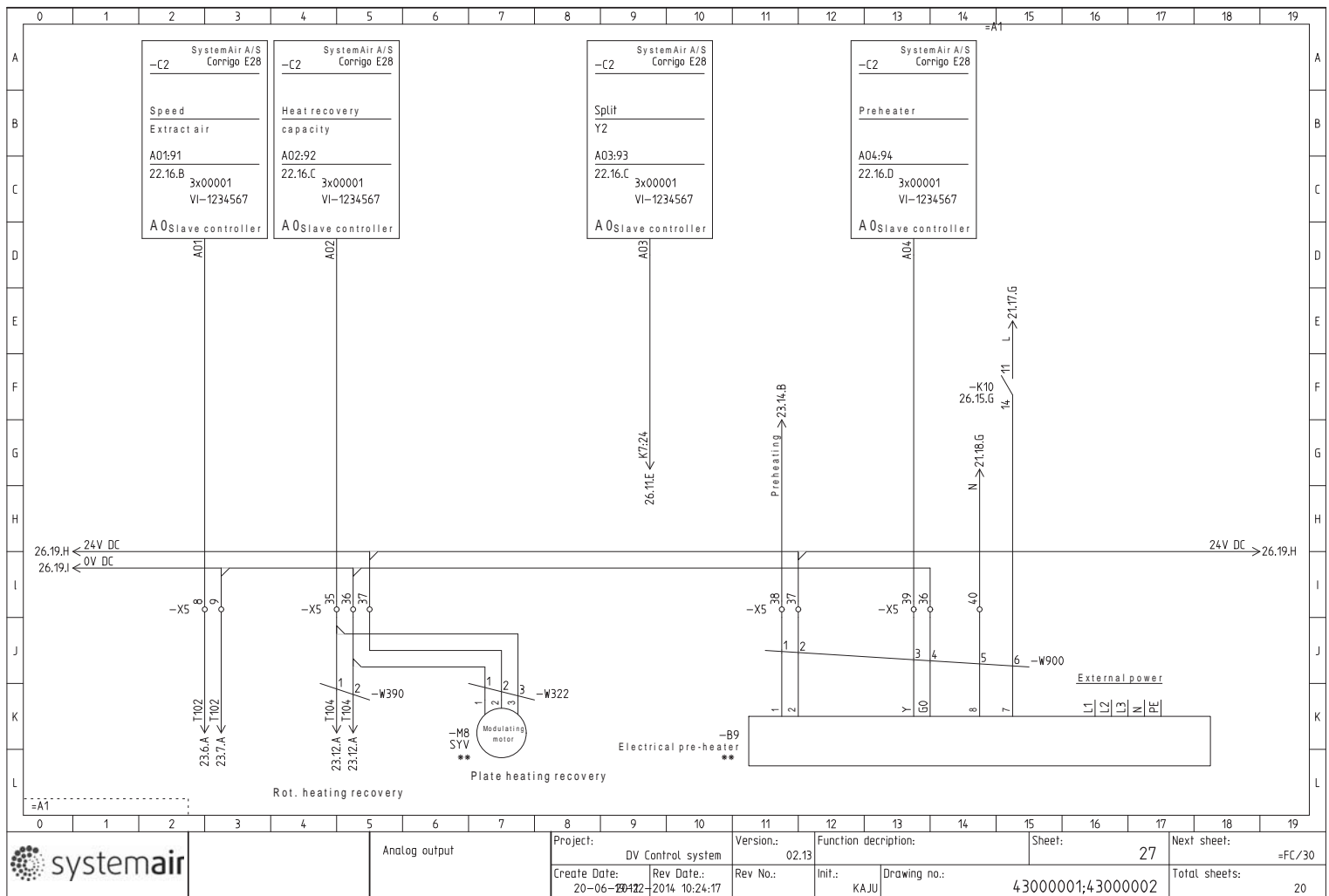









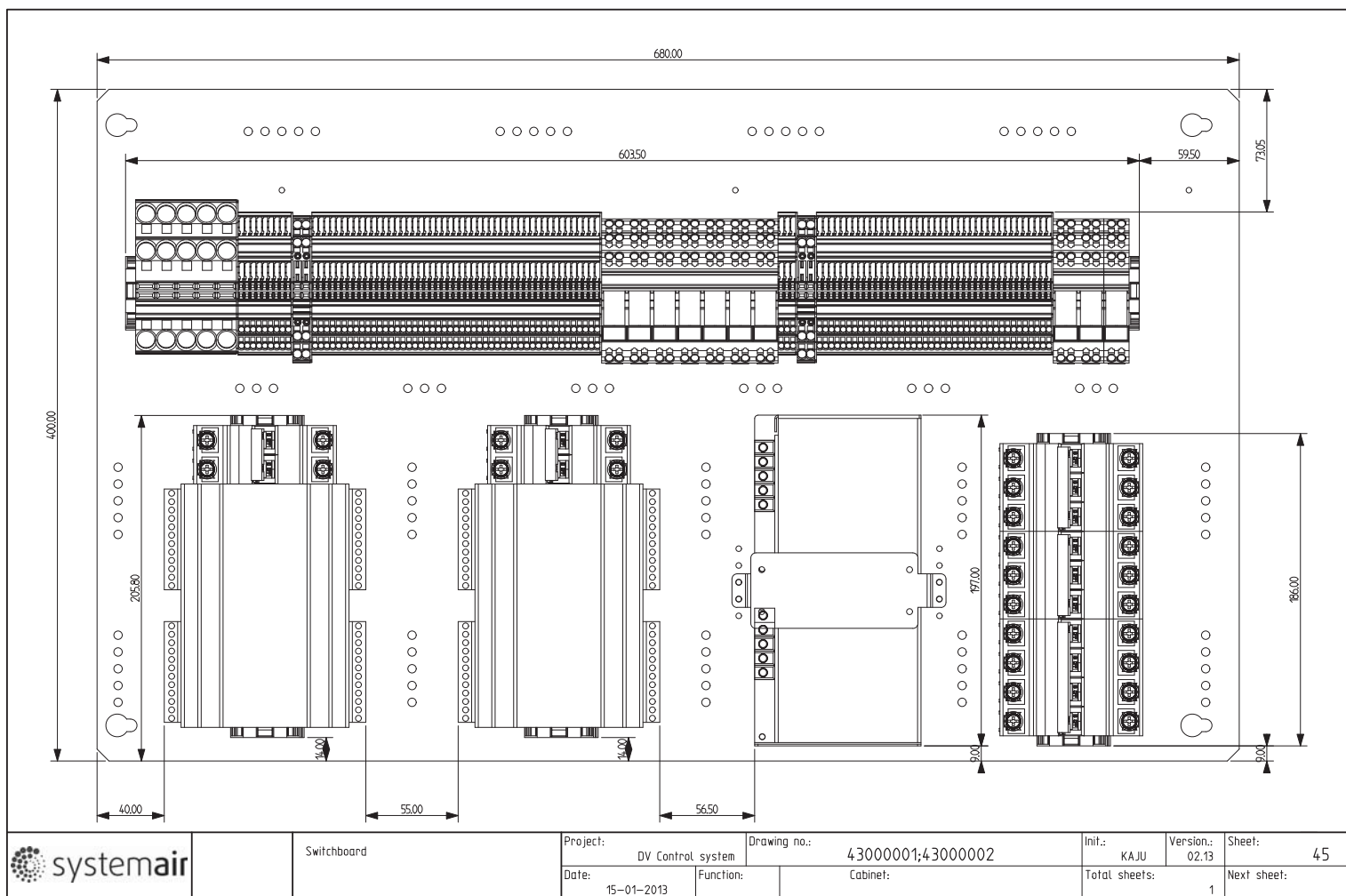





Analog output

| | | | | | | | | |
|--------------|-------------------|------------|----------|-----------------------|--------|------|---------------|-------------------|
| Project: | DV Control system | Version.: | 02.13 | Function description: | Sheet: | 27 | Next sheet: | =FC/30 |
| Create Date: | 20-06-2014 | Rev Date.: | 10:24:17 | Rev No.: | Init.: | KAJU | Drawing no.: | 43000001;43000002 |
| | | | | | | | Total sheets: | 20 |


| | | | | | | | | | | | | | | | | | | | | |
|--|-------------------|---|----------------|-----------------|---------------|------------|-----------|-------------------------|-------------|---------------------------|-----------|-----------------------|-----|--------------|-----|--------------|----|-------------|----|----|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| A | =FC | | | | | | | | | | | | | | | | | | | |
| | Parameter: | | 124 | 125 | 126 | 130 | 137 | 139 | 140 | 341 | 342 | 303 | 625 | 414 | 419 | | | | | |
| B | Motor Type Number | | Amp Name plate | Motor RPM rated | Nm Name plate | Ohm [Rf-f] | mH [Lf-f] | Poles | Bemf @ 1000 | Ramp up | Ramp Down | Max Hz | | Max motor Hz | | | | | | |
| C | HPS 71 3800 18 | | 1,8 | 3800 | 2 | 7,20 | 0,64 | 6 | 255 | 30 | 30 | 215 | 215 | 219 | 219 | | | | | |
| | HPS 71 3700 28 | | 2,8 | 3700 | 3,6 | 3,16 | 0,75 | 6 | 291 | 30 | 30 | 191 | 191 | 204 | 204 | | | | | |
| D | HPS 71 3300 18 | | 1,8 | 3300 | 2,6 | 11,50 | 0,81 | 6 | 280 | 30 | 30 | 170 | 170 | 182 | 182 | | | | | |
| | HPS 71 3200 30 | | 3 | 3200 | 4,2 | 3,70 | 0,80 | 6 | 268 | 30 | 30 | 161 | 161 | 176 | 176 | | | | | |
| E | HPS 71 2900 21 | | 2,1 | 2900 | 3,3 | 9,00 | 0,91 | 6 | 276 | 30 | 30 | 143 | 143 | 160 | 160 | | | | | |
| | HPS 71 2800 40 | | 4 | 2800 | 6,1 | 3,35 | 0,91 | 6 | 267 | 30 | 30 | 144 | 144 | 154 | 154 | | | | | |
| F | HPS 71 2500 29 | | 2,9 | 2500 | 5 | 6,00 | 1,00 | 6 | 262 | 30 | 30 | 129 | 129 | 138 | 138 | | | | | |
| | HPS 71 2350 38 | | 3,8 | 2350 | 7,3 | 4,60 | 1,10 | 6 | 271 | 30 | 30 | 120 | 120 | 129 | 129 | | | | | |
| G | HPS 90 2650 64 | | 6,4 | 2650 | 9,6 | 2,50 | 0,83 | 8 | 230 | 30 | 30 | 182 | 182 | 194 | 194 | | | | | |
| | HPS 90 2350 76 | | 7,6 | 2350 | 13 | 1,60 | 0,98 | 8 | 241 | 30 | 30 | 159 | 159 | 172 | 172 | | | | | |
| H | HPS 90 2100 63 | | 6,3 | 2100 | 10,5 | 3,00 | 0,96 | 8 | 212 | 30 | 30 | 142 | 142 | 154 | 154 | | | | | |
| | HPS 90 2050 100 | | 10 | 2050 | 19 | 1,40 | 1,10 | 8 | 236 | 30 | 30 | 140 | 140 | 150 | 150 | | | | | |
| I | HPS 90 1850 84 | | 8,4 | 1850 | 16 | 2,10 | 1,05 | 8 | 203 | 30 | 30 | 127 | 127 | 136 | 136 | | | | | |
| | HPS 90 1900 136 | | 13,6 | 1900 | 26 | 1,15 | 1,05 | 8 | 209 | 30 | 30 | 127 | 127 | 139 | 139 | | | | | |
| J | HPS 90 1700 106 | | 11 | 1700 | 22 | 1,15 | 1,15 | 8 | 199 | 30 | 30 | 116 | 116 | 125 | 125 | | | | | |
| | HPS 112 1550 108 | | 10,9 | 1550 | 32 | 1,50 | 1,70 | 6 | 276 | 30 | 30 | 80 | 80 | 85 | 85 | | | | | |
| K | HPS 112 1700 145 | | 14,5 | 1700 | 39 | 0,93 | 1,55 | 6 | 276 | 30 | 30 | 88 | 88 | 94 | 94 | | | | | |
| | HPS 112 1350 135 | | 13,5 | 1350 | 44 | 0,98 | 1,88 | 6 | 266 | 30 | 30 | 69 | 69 | 74 | 74 | | | | | |
| L | HPS 112 1500 187 | | 18,7 | 1500 | 54 | 0,59 | 1,67 | 6 | 262 | 30 | 30 | 76 | 76 | 83 | 83 | | | | | |
| | HPS 112 1000 140 | | 14 | 1000 | 51 | 0,95 | 2,10 | 6 | 242 | 30 | 30 | 54 | 54 | 55 | 55 | | | | | |
| | HPS 132 1250 199 | | 19,9 | 1250 | 69 | 0,51 | 2,00 | 6 | 262 | 30 | 30 | 65 | 65 | 69 | 69 | | | | | |
| | HPS 132 1000 202 | | 20,2 | 1000 | 77 | 0,63 | 2,20 | 6 | 230 | 30 | 30 | 51 | 51 | 65 | 65 | | | | | |
| | HPS 132 1150 300 | | 30 | 1150 | 104 | 0,47 | 2,20 | 6 | 265 | 30 | 30 | 58 | 58 | 65 | 65 | | | | | |
| | HPS 132 930 273 | | 27,3 | 930 | 118 | 0,56 | 2,50 | 6 | 243 | 30 | 30 | 46 | 46 | 65 | 65 | | | | | |
| | =FC | | | | | | | | | | | | | | | | | | | |
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|  | | | | | | | | Project: | | Version: | | Function description: | | | | Sheet: | | Next sheet: | | |
| | | | | | | | | DV Control system | | 02.13 | | | | | | 31 | | | | |
| | | | | | | | | Create Date: 19-11-2012 | | Rev Date.: 2014. 10.24.17 | | Rev No.: | | Init.: KAJU | | Drawing no.: | | 4 | | |




List of Documents

| List of Documents | | | | | | | | | | | |
|--|--------------|-------|---------------------|-----------------------------|---------------------|----------------------|--|-------------|--|--------------------------------|--|
| Function (=) | Location (+) | Sheet | Kind of Document | Description | Revision date | | | | | | |
| | | 1 | Document list | | 08-10-2014 | | | | | | |
| | | 2 | Document list | | 08-10-2014 | | | | | | |
| | | 3 | Document list | | 08-10-2014 | | | | | | |
| | | 4 | Document list | | 08-10-2014 | | | | | | |
| | | 1 | Project cover sheet | General Description Pages | 08-10-2014 12:56:09 | | | | | | |
| | | 2 | Project cover sheet | General Description Symbols | 08-10-2014 12:56:09 | | | | | | |
| | | 3 | Project cover sheet | General Description Symbols | 08-10-2014 12:56:09 | | | | | | |
| | | 4 | Project cover sheet | General Description Wires | 08-10-2014 12:56:09 | | | | | | |
| | | 5 | Project cover sheet | General Description | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 10 | Circuit Diagram IEC | Main power | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 11 | Circuit Diagram IEC | Main power | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 12 | Circuit Diagram IEC | Corrigo E28 | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 13 | Circuit Diagram IEC | Digital input | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 14 | Circuit Diagram IEC | Digital input | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 15 | Circuit Diagram IEC | Analog input | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 16 | Circuit Diagram IEC | Universal input | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 17 | Circuit Diagram IEC | Digital output | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 18 | Circuit Diagram IEC | Digital output | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 19 | Circuit Diagram IEC | Analog output | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 20 | Circuit Diagram IEC | Analog output | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 21 | Circuit Diagram IEC | Main power | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 22 | Circuit Diagram IEC | Corrigo E28 | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 23 | Circuit Diagram IEC | Digital input | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 24 | Circuit Diagram IEC | Analog input | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 25 | Circuit Diagram IEC | Universal input | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 26 | Circuit Diagram IEC | Digital output | 08-10-2014 12:56:09 | | | | | | |
| =A1 | | 27 | Circuit Diagram IEC | Analog output | 08-10-2014 12:56:09 | | | | | | |
| =FC | | 30 | Circuit Diagram IEC | | 08-10-2014 12:56:09 | | | | | | |
| =FC | | 31 | Circuit Diagram IEC | | 08-10-2014 12:56:09 | | | | | | |
| | | 45 | Cabinets | Switchboard | 08-10-2014 12:56:09 | | | | | | |
|  | | | | Project: | | Function decription: | | Sheet: | | Next sheet: | |
| | | | | Date: 08-10-2014 | | Rev.: | | Init.: KAJU | | Drawing no.: 43000001;43000002 | |
| | | | | | | | | 1 | | 2 | |

List of Documents

| List of Documents | | | | | | | | | | |
|--|--------------|-------|------------------|-------------|---------------------|-----------------------|--------|------|--------------|-------------------|
| Function (=) | Location (+) | Sheet | Kind of Document | Description | Revision date | | | | | |
| | | 1 | Terminal list | =A1-X1 | 08-10-2014 13:00:36 | | | | | |
| | | 2 | Terminal list | =A1-X2 | 08-10-2014 13:00:36 | | | | | |
| | | 3 | Terminal list | =A1-X3 | 08-10-2014 13:00:36 | | | | | |
| | | 4 | Terminal list | =A1-X3 | 08-10-2014 13:00:36 | | | | | |
| | | 5 | Terminal list | =A1-X4 | 08-10-2014 13:00:36 | | | | | |
| | | 6 | Terminal list | =A1-X5 | 08-10-2014 13:00:36 | | | | | |
| | | 7 | Terminal list | =A1-X5 | 08-10-2014 13:00:36 | | | | | |
| | | 40 | Cable-Core list | | 08-10-2014 13:00:38 | | | | | |
| | | 41 | Cable-Core list | | 08-10-2014 13:00:38 | | | | | |
| | | 42 | Cable-Core list | | 08-10-2014 13:00:38 | | | | | |
| | | 43 | Cable-Core list | | 08-10-2014 13:00:38 | | | | | |
| | | 44 | Cable-Core list | | 08-10-2014 13:00:38 | | | | | |
| | | 45 | Cable-Core list | | 08-10-2014 13:00:38 | | | | | |
| | | 46 | Cable-Core list | | 08-10-2014 13:00:38 | | | | | |
| | | 47 | Cable-Core list | | 08-10-2014 13:00:38 | | | | | |
| | | 48 | Cable-Core list | | 08-10-2014 13:00:38 | | | | | |
| | | 49 | Cable-Core list | | 08-10-2014 13:00:38 | | | | | |
| | | 50 | Cable-Core list | | 08-10-2014 13:00:38 | | | | | |
| | | 51 | Cable-Core list | | 08-10-2014 13:00:38 | | | | | |
| | | 1 | PLC I/O list | | 08-10-2014 13:00:39 | | | | | |
| | | 2 | PLC I/O list | | 08-10-2014 13:00:39 | | | | | |
| =A1 | | 60 | Terminal Matrix | -X1 | 08-10-2014 13:00:39 | | | | | |
| =A1 | | 61 | Terminal Matrix | -X2 | 08-10-2014 13:00:39 | | | | | |
| =A1 | | 62 | Terminal Matrix | -X3 | 08-10-2014 13:00:39 | | | | | |
| =A1 | | 63 | Terminal Matrix | -X3 | 08-10-2014 13:00:39 | | | | | |
| =A1 | | 64 | Terminal Matrix | -X4 | 08-10-2014 13:00:39 | | | | | |
| =A1 | | 65 | Terminal Matrix | -X5 | 08-10-2014 13:00:39 | | | | | |
| =A1 | | 66 | Terminal Matrix | -X5 | 08-10-2014 13:00:39 | | | | | |
| | | 70 | Cable plan | | 08-10-2014 13:00:49 | | | | | |
| | | 71 | Cable plan | | 08-10-2014 13:00:49 | | | | | |
|  | | | | Project: | DV Control system | Function description: | Sheet: | 2 | Next sheet: | 3 |
| | | | | Date: | 08-10-2014 | Rev.: | Init.: | KAJU | Drawing no.: | 43000001;43000002 |

List of Documents

| List of Documents | | | | | | | | | | |
|--|--------------|-------|------------------|-------------------|-------|-----------------------|-------------------|--------|---------------|---------------------|
| Function (=) | Location (+) | Sheet | Kind of Document | Description | | | | | | Revision date |
| | | 72 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 73 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 74 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 75 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 76 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 77 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 78 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 79 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 80 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 81 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 82 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 83 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 84 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 85 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 86 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 87 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 88 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 89 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 90 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 91 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| | | 92 | Cable plan | | | | | | | 08-10-2014 13:00:49 |
| =A1 | | 90 | Terminal Plan | -X1 | | | | | | 08-10-2014 13:01:14 |
| =A1 | | 91 | Terminal Plan | -X2 | | | | | | 08-10-2014 13:01:14 |
| =A1 | | 92 | Terminal Plan | -X3 | | | | | | 08-10-2014 13:01:14 |
| =A1 | | 93 | Terminal Plan | -X3 | | | | | | 08-10-2014 13:01:14 |
| =A1 | | 94 | Terminal Plan | -X3 | | | | | | 08-10-2014 13:01:14 |
| =A1 | | 95 | Terminal Plan | -X3 | | | | | | 08-10-2014 13:01:14 |
| =A1 | | 96 | Terminal Plan | -X3 | | | | | | 08-10-2014 13:01:14 |
| =A1 | | 97 | Terminal Plan | -X3 | | | | | | 08-10-2014 13:01:14 |
| =A1 | | 98 | Terminal Plan | -X3 | | | | | | 08-10-2014 13:01:14 |
|  | | | | Project: | | Function description: | | Sheet: | | Next sheet: |
| | | | | DV Control system | | | | 3 | | 4 |
| | | | | Date: | Rev.: | Init.: | Drawing no.: | | Total sheets: | |
| | | | | 08-10-2014 | | KAJU | 43000001;43000002 | | 4 | |

List of Documents

| | | | | | | | | |
|--|--|--|-------------------|-------|-----------------------|-------------------|---------------|-------------|
|  | | | Project: | | Function description: | | Sheet: | Next sheet: |
| | | | DV Control system | | | | 4 | |
| | | | Date: | Rev.: | Init.: | Drawing no.: | Total sheets: | |
| | | | 08-10-2014 | | KAJU | 43000001;43000002 | 4 | |

| |
|------------------------|
| List of Terminals: -X1 |
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[illegible]

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List of Terminals: -X3


| List of Terminals: -X3 | | | | | | | |
|--|----------|------------------|-------------------|---------|-----------------------|-------------------|--------------|
| Connection 1 | Terminal | Connection 2 | Type | Comment | Sheet | Cell | |
| =A1-B3:3 | 1 | =A1-C1:DI1 | 1492-K2 | | 13 | 2.E | |
| =A1-C1:1 G | 2 | =A1-B3:1 | 1492-K2 | | 13 | 2.A | |
| =A1-K1:11 | 3 | =A1-T101:12 | 1492-K2 | | 13 | 4.D | |
| =A1-K5:21 | 4 | =A1-T101:18 | 1492-K2 | | 13 | 5.D | |
| =A1-X3:10 | 5 | =A1-T101:01 | 1492-K2 | | 13 | 4.H | |
| =A1-C1:DI2 | 6 | =A1-T101:02 | 1492-K2 | | 13 | 5.H | |
| =A1-C1:AO1 | 7 | =A1-T101:54 | 1492-K2 | | 19 | 2.I | |
| =A1-K5:A2 | 8 | =A1-T101:55 | 1492-K2 | | 19 | 3.I | |
| =A1-DVU:8 | 9 | =A1-C1:DI3 | 1492-K2 | | 13 | 11.H | |
| =A1-X3:13 | 10 | =A1-S2 | 1492-K2 | | 13 | 15.A | |
| =A1-C1:DI5 | 11 | =A1-S2 | 1492-K2 | | 13 | 15.F | |
| =A1-C1:DI6 | 12 | =A1-S10 | 1492-K2 | | 13 | 17.F | |
| =A1-X3:13 | 13 | =A1-B4 | 1492-K2 | | 14 | 2.A | |
| =A1-B5 | 14 | =A1-B4 | 1492-K2 | | 14 | 2.D | |
| =A1-C1:DI7 | 15 | =A1-B6:10 | 1492-K2 | | 14 | 2.H | |
| =A1-C1:2 GO | 16 | =A1-B6:1 | 1492-K2 | | 14 | 8.B | |
| =A1-X3:17 | 17 | =B8:1 | 1492-K2 | | 14 | 12.A | |
| =A1-C1:DI8 | 18 | =B8:2 | 1492-K2 | | 14 | 12.H | |
| =A1-C1:AI1 | 19 | =A1-R3 | 1492-K2 | | 15 | 3.F | |
| =A1-X3:16 | 20 | =A1-R3 | 1492-K2 | | 15 | 3.F | |
| =A1-C1:AI2 | 21 | =A1-R4 | 1492-K2 | | 15 | 7.F | |
| =A1-C1:AI3 | 22 | =A1-R9 | 1492-K2 | | 15 | 11.F | |
| =A1-X3:23 | 23 | =A1-R9 | 1492-K2 | | 15 | 11.F | |
| =A1-C1:AI4 | 24 | =A1-R5 | 1492-K2 | | 15 | 15.F | |
| =A1-C1:UI1 | 25 | =A1-P4:0-10V | 1492-K2 | | 16 | 2.F | |
| =A1-X3:23 | 26 | =A1-P4:ANG | 1492-K2 | | 16 | 2.F | |
| =A1-X3:17 | 27 | =A1-P4:24V | 1492-K2 | | 16 | 3.F | |
| =A1-C1:UI2 | 28 | =A1-P1:0-10V | 1492-K2 | | 16 | 6.F | |
| =A1-C1:UI3 | 29 | =A1-P7/-P8:0-10V | 1492-K2 | | 16 | 11.F | |
| =A1-X3:26 | 30 | =A1-P7/-P8:ANG | 1492-K2 | | 16 | 10.F | |
|  | | =A1-X3 | Project: | | Function description: | Sheet: | Next sheet: |
| | | | 08-10-2014 | | Rev.: | Init.: | Drawing no.: |
| | | | DV Control system | | KAJU | 43000001;43000002 | 7 |

List of Terminals: -X3

| Connection 1 | Terminal | Connection 2 | Type | Comment | Sheet | Cell |
|--|----------|-----------------------|---|--|-----------------------------|---------------|
| =A1-X3:31 | 31 | =A1-P7/-P8:24V | 1492-K2 | | 16 | 11.F |
| =A1-C1:U4 | 32 | =A1-P3:0-10V | 1492-K2 | | 16 | 15.F |
| =A1-K8:11 | 33 | =A1-M4s:2 | 5 | | 18 | 2.I |
| =A1-K8:14 | 34 | =A1-M4:2 | 1492-K2 | | 18 | 2.I |
| =A1-X3:35 | 35 | =A1-M4:1 | 1492-K2 | | 18 | 1.I |
| =A1-X3:33 | 36 | =A1-M10:3 | 5 | | 18 | 7.I |
| =A1-K9:11 | 37 | =A1-M11:3 | 1492-K2 | | 18 | 12.I |
| =A1-X3:35 | 38 | =A1-M11:1 | 1492-K2 | | 18 | 12.I |
| =A1-K9:14 | 39 | =A1-M11:2 | 1492-K2 | | 18 | 12.I |
| =A1-K5:A1 | 40 | =A1-B8:4 | 1492-K2 | | 18 | 17.G |
| =A1-C1:A02 | 41 | =A1-M6:3 | 1492-K2 | | 19 | 4.I |
| =A1-X3:8 | 42 | =B8:G0 | 1492-K2 | | 19 | 5.I |
| =A1-X3:39 | 43 | =A1-M6:2 | 1492-K2 | | 19 | 5.I |
| =A1-C1:A03 | 44 | =A1-M7:3 | 1492-K2 | | 19 | 11.I |
| =A1-X3:43 | 45 | =A1-Corrigo E0-R 1 G | 1492-K2 | | 20 | 12.F |
| =A1-X3:42 | 46 | =A1-Corrigo E0-R 2 G0 | 1492-K2 | | 20 | 12.F |
| =A1-X3:45 | 47 | | 1492-K2 | | 20 | 10.F |
| =A1-K2:21 | 48 | =A1-Heating active | 1492-K2 | | 20 | 7.F |
| =A1-K2:24 | 49 | =A1-Heating active | 1492-K2 | Extract | 20 | 6.F |
| =A1-B8:1 | 50 | =A1-B7:4 | 1492-K2 | | 18 | 17.D |
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| | | | | | | |
|  | | =A1-X3 | Project: DV Control system Date: 08-10-2014 Rev.: | Function description: Init.: KAJU Drawing no.: 43000001;43000002 | Sheet: 4 Total sheets: 7 | Next sheet: 5 |

[illegible]

List of Terminals: -X5

| List of Terminals: -X5 | | | | | | | |
|--|----------|------------------|----------------------------|---------|-------------|--------------------------------|-----------------|
| Connection 1 | Terminal | Connection 2 | Type | Comment | Sheet | Cell | |
| =A1-C2:1 G | 1 | =A1-B1:1 | 1492-K2 | | 23 | 2.A | |
| =A1-B1:3 | 2 | =A1-B2:1 | 1492-K2 | | 23 | 2.D | |
| =A1-B2:3 | 3 | =A1-C2:D1 | 1492-K2 | | 23 | 2.G | |
| =A1-K6:11 | 4 | =A1-T102.1:12 | 1492-K2 | | 23 | 5.C | |
| =A1-K6:14 | 5 | =A1-T102:18 | 1492-K2 | | 23 | 5.C | |
| =A1-X5:11 | 6 | =A1-T102:01 | 1492-K2 | | 23 | 5.H | |
| =A1-C2:D12 | 7 | =A1-T102:02 | 1492-K2 | | 23 | 5.H | |
| =A1-C2:A01 | 8 | =A1-T102.1:54 | 1492-K2 | | 27 | 2.I | |
| =A1-X5:36 | 9 | =A1-T102.1:55 | 1492-K2 | | 27 | 3.J | |
| =A1-C2:D13 | 10 | =A1-T110:9 | 1492-K2 | | 23 | 12.F | |
| =A1-X5:11 | 11 | =A1-T110:10 | 1492-K2 | | 23 | 12.F | |
| =A1-changeover signal | 12 | =A1-C2:D15 | 1492-K2 | | 23 | 16.G | |
| =A1-Rec signal | 13 | =A1-C2:D16 | 1492-K2 | | 23 | 18.G | |
| =A1-X5:14 | 14 | =A1-P9/-P5:24V | 1492-K2 | | 24 | 9.E | |
| =A1-X5:21 | 15 | =A1-P9/-P5:ANG | 1492-K2 | | 24 | 8.E | |
| =A1-C2:A13 | 16 | =A1-P9/-P5:0-10V | 1492-K2 | | 24 | 8.E | |
| =A1-C2:A11 | 17 | =A1-R1 | 1492-K2 | | 24 | 2.E | |
| =A1-X5:18 | 18 | =A1-R1 | 1492-K2 | | 24 | 2.E | |
| =A1-C2:A12 | 19 | =A1-R6 | 1492-K2 | | 24 | 5.E | |
| =A1-C2:A14 | 20 | =A1-R2 | 1492-K2 | | 24 | 12.E | |
| =A1-X5:15 | 21 | =A1-R2 | 1492-K2 | | 24 | 12.E | |
| =A1-C2:U11 | 22 | =A1-R7 | 1492-K2 | | 25 | 2.E | |
| =A1-C2:U12 | 23 | =A1-R8 | 1492-K2 | | 25 | 5.E | |
| =A1-X5:24 | 24 | =A1-R8 | 1492-K2 | | 25 | 5.E | |
| =A1-X5:14 | 25 | =A1-P6:24V | 1492-K2 | | 25 | 11.E | |
| =A1-C2:U13 | 26 | =A1-P6:0-10V | 1492-K2 | | 25 | 10.E | |
| =A1-C2:U14 | 27 | =A1-P2:0-10V | 1492-K2 | | 25 | 14.E | |
| =A1-X5:25 | 28 | =A1-P2:24V | 1492-K2 | | 25 | 15.E | |
| =A1-X5:24 | 29 | =A1-P2:ANG | 1492-K2 | | 25 | 14.E | |
| =A1-K7:11 | 30 | =A1-M3s:2 | 1492-K2 | | 26 | 5.I | |
|  | | =A1-X5 | Project: DV Control system | | Sheet: 6 | Next sheet: 7 | |
| | | | Date: 08-10-2014 | Rev.: | Init.: KAJU | Drawing no.: 43000001;43000002 | Total sheets: 7 |
| | | | | | | | |


[illegible]

List of Cable Cores

| List of Cable Cores | | | | | | |
|---------------------|------|--------------|-----------------------|--------------------|-------|------|
| Cable name (-) | Wire | Connection 1 | Connection 2 | Description | Sheet | Path |
| -W90 | 1 | =A1-X3:45 | =A1-Corrigo E0-R 1 G | Remote panel | 20 | 12.G |
| -W90 | 2 | =A1-X3:46 | =A1-Corrigo E0-R 2 G0 | Remote panel | 20 | 12.G |
| -W90 | 3 | =A1-C1:50 B | =A1-Corrigo E0-R | Remote panel | 12 | 6.J |
| -W90 | 4 | =A1-C1:51 A | =A1-Corrigo E0-R | Remote panel | 12 | 6.J |
| -W90 | 5 | =A1-C1:52 N | =A1-Corrigo E0-R | Remote panel | 12 | 6.J |
| -W100 | 1 | =A1-X2:3 | =A1-M12:U | Mixing pump | 11 | 5.J |
| -W100 | 2 | =A1-X2:4 | =A1-M12:N | Mixing pump | 11 | 5.J |
| -W100 | 3 | =A1PE | =A1-M12:PE | Mixing pump | 11 | 5.J |
| -W101 | 1 | =A1-X4:1 | =A1-T110:L | VVX Power | 21 | 17.K |
| -W101 | 2 | =A1-X4:2 | =A1-T110:N | VVX Power | 21 | 17.K |
| -W101 | 3 | =A1-X4:3 | =A1-T110:PE | VVX Power | 21 | 17.K |
| -W101.1 | 1 | =A1-F1:1 | =A1-T101:L1 | VLT Supply air | 10 | 7.F |
| -W101.1 | 2 | =A1-F1:3 | =A1-T101:L2 | VLT Supply air | 10 | 7.F |
| -W101.1 | 3 | =A1-F1:5 | =A1-T101:L3 | VLT Supply air | 10 | 7.F |
| -W101.1 | 4 | =A1PE | =A1-T101:PE | VLT Supply air | 10 | 8.F |
| -W101.1.2 | 1 | =A1-F1:1 | =A1-T101.1:L1 | VLT Supply air | 10 | 14.F |
| -W101.1.2 | 2 | =A1-F1:3 | =A1-T101.1:L2 | VLT Supply air | 10 | 14.F |
| -W101.1.2 | 3 | =A1-F1:5 | =A1-T101.1:L3 | VLT Supply air | 10 | 14.F |
| -W101.1.2 | 4 | =A1PE | =A1-T101.1:PE | VLT Supply air | 10 | 15.F |
| -W101.2 | 1 | =A1-X3:3 | =A1-T101:12 | VLT control supply | 13 | 4.E |


| | | | | | | | | | | |
|--|--|--|-------------------|-------|-----------------------|-------------------|--------|---------------|-------------|--|
|  | | | Project: | | Function description: | | Sheet: | | Next sheet: | |
| | | | DV Control system | | | | 40 | | 41 | |
| | | | Date: | Rev.: | Init.: | Drawing no.: | | Total sheets: | | |
| | | | 08-10-2014 | | KAJU | 43000001;43000002 | | 12 | | |

List of Cable Cores


| List of Cable Cores | | | | | | | |
|--|------|--------------|-------------------|--------------------|-----------------------|-------------------|---------------|
| Cablename (-) | Wire | Connection 1 | Connection 2 | Description | Sheet | Path | |
| -W101.2 | 2 | =A1-X3:4 | =A1-T101:18 | VLT control supply | 13 | 5.E | |
| -W101.2 | 3 | =A1-X3:5 | =A1-T101:01 | VLT control supply | 13 | 4.G | |
| -W101.2 | 4 | =A1-X3:6 | =A1-T101:02 | VLT control supply | 13 | 5.G | |
| -W101.2 | 5 | =A1-X3:7 | =A1-T101:54 | VLT control supply | 13 | 5.E | |
| -W101.2 | 6 | =A1-X3:8 | =A1-T101:55 | VLT control supply | 13 | 6.E | |
| -W101.2.2 | 1 | =A1-X3:3 | =A1-T101.1:12 | VLT control supply | 13 | 7.E | |
| -W101.2.2 | 2 | =A1-X3:4 | =A1-T101.1:18 | VLT control supply | 13 | 7.E | |
| -W101.2.2 | 5 | =A1-X3:7 | =A1-T101.1:54 | VLT control supply | 13 | 8.E | |
| -W101.2.2 | 6 | =A1-X3:8 | =A1-T101.1:55 | VLT control supply | 13 | 8.E | |
| -W101.3 | 1 | =A1-T101:U | =A1-M1:U1 | motor supplyair | 10 | 7.J | |
| -W101.3 | 2 | =A1-T101:V | =A1-M1:V1 | motor supplyair | 10 | 7.J | |
| -W101.3 | 3 | =A1-T101:W | =A1-M1:W1 | motor supplyair | 10 | 7.J | |
| -W101.3 | 4 | =A1-T101:PE | =A1-M1:PE | motor supplyair | 10 | 8.J | |
| -W101.3 | 5 | =A1-T101:PE | =A1-M1:PE | motor supplyair | 10 | 8.J | |
| -W101.3.1 | 1 | =A1-T101:U | =A1-M1.1:U1 | motor supplyair | 10 | 10.J | |
| -W101.3.1 | 2 | =A1-T101:V | =A1-M1.1:V1 | motor supplyair | 10 | 11.J | |
| -W101.3.1 | 3 | =A1-T101:W | =A1-M1.1:W1 | motor supplyair | 10 | 11.J | |
| -W101.3.1 | 4 | =A1-T101:PE | =A1-M1.1:PE | motor supplyair | 10 | 11.J | |
| -W101.3.1 | 5 | =A1-T101:PE | =A1-M1.1:PE | motor supplyair | 10 | 11.J | |
| -W101.3.2 | 1 | =A1-T101.1:U | =A1-M1.2:U1 | motor supplyair | 10 | 14.J | |
|  | | | Project: | | Function description: | Sheet: | Next sheet: |
| | | | DV Control system | | | 41 | 42 |
| | | | Date: | Rev.: | Init.: | Drawing no.: | Total sheets: |
| | | | 08-10-2014 | | KAJU | 43000001;43000002 | 12 |

List of Cable Cores

| List of Cable Cores | | | | | | |
|---------------------|------|---------------|---------------|---------------------|-------|------|
| Cablename (-) | Wire | Connection 1 | Connection 2 | Description | Sheet | Path |
| -W101.3.2 | 2 | =A1-T101.1:V | =A1-M1.2:V1 | motor supplyair | 10 | 14.J |
| -W101.3.2 | 3 | =A1-T101.1:W | =A1-M1.2:W1 | motor supplyair | 10 | 14.J |
| -W101.3.2 | 4 | =A1-T101.1:PE | =A1-M1.2:PE | motor supplyair | 10 | 15.J |
| -W101.3.2 | 5 | =A1-T101.1:PE | =A1-M1.2:PE | motor supplyair | 10 | 15.J |
| -W101.4 | 1 | =A1-T101:53 | =A1-R17:1 | Supply thermistor | 10 | 6.J |
| -W101.4 | 2 | =A1-T101:50 | =A1-R17:2 | Supply thermistor | 10 | 6.J |
| -W101.4.1 | 1 | | =A1-R17.1:1 | Supply thermistor | 10 | 9.J |
| -W101.4.1 | 2 | | =A1-R17.1:2 | Supply thermistor | 10 | 9.J |
| -W101.4.2 | 1 | =A1-T101.1:53 | =A1-R19:1 | Supply thermistor | 10 | 13.J |
| -W101.4.2 | 2 | =A1-T101.1:50 | =A1-R19:2 | Supply thermistor | 10 | 13.J |
| -W102.1 | 1 | =A1-F4:1 | =A1-T102:L1 | VLT extract power | 21 | 3.F |
| -W102.1 | 2 | =A1-F4:3 | =A1-T102:L2 | VLT extract power | 21 | 3.F |
| -W102.1 | 3 | =A1-F4:5 | =A1-T102:L3 | VLT extract power | 21 | 3.F |
| -W102.1 | 4 | =A1PE | =A1-T102:PE | VLT extract power | 21 | 3.F |
| -W102.1.2 | 1 | =A1-F4:1 | =A1-T102.1:L1 | VLT extract power | 21 | 11.F |
| -W102.1.2 | 2 | =A1-F4:3 | =A1-T102.1:L2 | VLT extract power | 21 | 11.F |
| -W102.1.2 | 3 | =A1-F4:5 | =A1-T102.1:L3 | VLT extract power | 21 | 11.F |
| -W102.1.2 | 4 | =A1PE | =A1-T102.1:PE | VLT extract power | 21 | 12.F |
| -W102.2 | 1 | =A1-X5:4 | =A1-T102:12 | VLT control extract | 23 | 5.D |
| -W102.2 | 2 | =A1-X5:5 | =A1-T102:18 | VLT control extract | 23 | 5.E |


| | | | | | | | | | | |
|--|--|--|-------------------|-------|-----------------------|-------------------|--------|---------------|-------------|--|
|  | | | Project: | | Function description: | | Sheet: | | Next sheet: | |
| | | | DV Control system | | | | 42 | | 43 | |
| | | | Date: | Rev.: | Init.: | Drawing no.: | | Total sheets: | | |
| | | | 08-10-2014 | | KAJU | 43000001;43000002 | | 12 | | |

List of Cable Cores




| Cablename (-) | Wire | Connection 1 | Connection 2 | Description | Sheet | Path |
|--|------|-------------------|---------------|-----------------------|-------------------|---------------|
| -W102.2 | 3 | =A1-X5:6 | =A1-T102:01 | VLT control extract | 23 | 5.G |
| -W102.2 | 4 | =A1-X5:7 | =A1-T102:02 | VLT control extract | 23 | 5.G |
| -W102.2 | 5 | =A1-X5:8 | =A1-T102:54 | VLT control extract | 23 | 6.E |
| -W102.2 | 6 | =A1-X5:9 | =A1-T102:55 | VLT control extract | 23 | 7.E |
| -W102.2.2 | 1 | =A1-X5:4 | =A1-T102.1:12 | VLT control extract | 23 | 8.D |
| -W102.2.2 | 2 | =A1-X5:5 | =A1-T102.1:18 | VLT control extract | 23 | 8.E |
| -W102.2.2 | 5 | =A1-X5:8 | =A1-T102.1:54 | VLT control extract | 23 | 10.E |
| -W102.2.2 | 6 | =A1-X5:9 | =A1-T102.1:55 | VLT control extract | 23 | 10.E |
| -W102.3 | 1 | =A1-T102:U | =A1-M2:U1 | motorcable power | 21 | 3.K |
| -W102.3 | 2 | =A1-T102:V | =A1-M2:V1 | motorcable power | 21 | 3.K |
| -W102.3 | 3 | =A1-T102:W | =A1-M2:W1 | motorcable power | 21 | 3.K |
| -W102.3 | 4 | =A1-T102:PE | =A1-M2:PE | motorcable power | 21 | 3.K |
| -W102.3 | 5 | | =A1-M2:PE | motorcable power | 21 | 4.J |
| -W102.3.1 | 1 | =A1-T102:U | =A1-M2.1:U1 | motorcable power | 21 | 6.K |
| -W102.3.1 | 2 | =A1-T102:V | =A1-M2.1:V1 | motorcable power | 21 | 7.K |
| -W102.3.1 | 3 | =A1-T102:W | =A1-M2.1:W1 | motorcable power | 21 | 7.K |
| -W102.3.1 | 4 | =A1-T102:PE | =A1-M2.1:PE | motorcable power | 21 | 7.K |
| -W102.3.1 | 5 | =A1-T102:PE | =A1-M2.1:PE | motorcable power | 21 | 7.J |
| -W102.3.2 | 1 | =A1-T102.1:U | =A1-M2.2:U1 | motorcable power | 21 | 11.K |
| -W102.3.2 | 2 | =A1-T102.1:V | =A1-M2.2:V1 | motorcable power | 21 | 11.K |
|  | | Project: | | Function description: | Sheet: | Next sheet: |
| | | DV Control system | | | 43 | 44 |
| | | Date: | Rev.: | Init.: | Drawing no.: | Total sheets: |
| | | 08-10-2014 | | KAJU | 43000001;43000002 | 12 |

List of Cable Cores


| List of Cable Cores | | | | | | |
|---------------------|------|---------------|--------------|-----------------------------|-------|------|
| Cablename (-) | Wire | Connection 1 | Connection 2 | Description | Sheet | Path |
| -W102.3.2 | 3 | =A1-T102.1:W | =A1-M2.2:W1 | motorcable power | 21 | 11.K |
| -W102.3.2 | 4 | =A1-T102.1:PE | =A1-M2.2:PE | motorcable power | 21 | 12.K |
| -W102.3.2 | 5 | =A1-T102.1:PE | =A1-M2.2:PE | motorcable power | 21 | 12.J |
| -W102.4 | 1 | =A1-T102:53 | =A1-R18:1 | Extract thermistor | 21 | 1.J |
| -W102.4 | 2 | =A1-T102:50 | =A1-R18:2 | Extract thermistor | 21 | 2.J |
| -W102.4.1 | 1 | | =A1-R18.1:1 | Extract thermistor | 21 | 5.J |
| -W102.4.1 | 2 | | =A1-R18.1:2 | Extract thermistor | 21 | 5.J |
| -W102.4.2 | 1 | =A1-T102.1:53 | =A1-R20:1 | Extract thermistor | 21 | 10.J |
| -W102.4.2 | 2 | =A1-T102.1:50 | =A1-R20:2 | Extract thermistor | 21 | 10.J |
| -W301 | 1 | =A1-X5:1 | =A1-B1:1 | Filterguard supply | 23 | 2.B |
| -W301 | 2 | =A1-X5:2 | =A1-B1:3 | Filterguard supply | 23 | 2.D |
| -W301.1 | 1 | =A1-X5:2 | =A1-B2:1 | Pre-filterguard supply | 23 | 2.E |
| -W301.1 | 2 | =A1-X5:3 | =A1-B2:3 | Pre-filterguard supply | 23 | 2.F |
| -W302 | 1 | =A1-X3:2 | =A1-B3:1 | Filterguard Extract | 13 | 2.C |
| -W302 | 2 | =A1-X3:1 | =A1-B3:3 | Filterguard Extract | 13 | 2.E |
| -W304 | 1 | =A1-X3:13 | =A1-B4 | Fire thermostat supply air | 14 | 2.B |
| -W304 | 2 | =A1-X3:14 | =A1-B4 | Fire thermostat supply air | 14 | 2.D |
| -W305 | 1 | =A1-X3:14 | =A1-B5 | Fire thermostat extract air | 14 | 2.E |
| -W305 | 2 | =A1-X3:15 | =A1-B5 | Fire thermostat extract air | 14 | 2.G |
| -W306 | 1 | =A1-X3:16 | =A1-B6:1 | Smokedetector | 14 | 8.C |

| | | | | | | | | | | |
|--|--|--|-------------------|-------|-----------------------|-------------------|--------|--|---------------|--|
|  | | | Project: | | Function description: | | Sheet: | | Next sheet: | |
| | | | DV Control system | | | | 44 | | 45 | |
| | | | Date: | Rev.: | Init.: | Drawing no.: | | | Total sheets: | |
| | | | 08-10-2014 | | KAJU | 43000001;43000002 | | | 12 | |

List of Cable Cores

| List of Cable Cores | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|------|--------------|-------------------|-------------------------------|-----------------------|-------------------|--|--|--|-------------|--|-----------------------|--------|-------------|--|-------------------|--|--|----|----|--|--|--|--|-------|-------|--------|--------------|---------------|--|--|--|--|------------|--|------|-------------------|----|--|
| Cablename (-) | Wire | Connection 1 | Connection 2 | Description | Sheet | Path | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W306 | 2 | =A1-X3:17 | =A1-B6:2 | Smokedetector | 14 | 8.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W306 | 3 | =A1-X3:13 | =A1-B6:4 | Smokedetector | 14 | 7.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W306 | 4 | =A1-X3:15 | =A1-B6:10 | Smokedetector | 14 | 7.E | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W310 | 1 | =A1-X3:20 | =A1-R3 | Temperatur sensor extract | 15 | 3.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W310 | 2 | =A1-X3:19 | =A1-R3 | Temperatur sensor extract | 15 | 3.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W311 | 1 | =A1-X3:20 | =A1-R4 | Temperatur sensor supply air | 15 | 7.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W311 | 2 | =A1-X3:21 | =A1-R4 | Temperatur sensor supply air | 15 | 7.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W312 | 1 | =A1-X5:18 | =A1-R1 | Temperatur sensor intake | 24 | 2.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W312 | 2 | =A1-X5:17 | =A1-R1 | Temperatur sensor intake | 24 | 2.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W313 | 1 | =A1-X5:21 | =A1-R2 | Temperatur sensor exhaust | 24 | 12.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W313 | 2 | =A1-X5:20 | =A1-R2 | Temperatur sensor exhaust | 24 | 12.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W314 | 1 | =A1-X3:23 | =A1-R5 | Frost protection heating coil | 15 | 15.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W314 | 2 | =A1-X3:24 | =A1-R5 | Frost protection heating coil | 15 | 15.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W315 | 1 | =A1-X5:18 | =A1-R6 | Deicing for plate heat | 24 | 5.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W315 | 2 | =A1-X5:19 | =A1-R6 | Deicing for plate heat | 24 | 5.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W319 | 1 | =A1-X3:17 | -B8:1 | Electrical heating coil | 14 | 12.B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W319 | 2 | =A1-X3:18 | -B8:2 | Electrical heating coil | 14 | 12.F | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W319 | 3 | =A1-X3:41 | -B8:Y | Electrical heating coil | 14 | 13.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W319 | 4 | =A1-X3:42 | -B8:GO | Electrical heating coil | 14 | 14.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| -W319 | 5 | =A1-X2:3 | -B8:7 | Electrical heating coil | 14 | 14.C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table><tr><td rowspan="2"></td><td rowspan="2"></td><td rowspan="2"></td><td colspan="2">Project:</td><td>Function description:</td><td>Sheet:</td><td colspan="2">Next sheet:</td></tr><tr><td colspan="2">DV Control system</td><td></td><td>45</td><td colspan="2">46</td></tr><tr><td colspan="3"></td><td>Date:</td><td>Rev.:</td><td>Init.:</td><td>Drawing no.:</td><td colspan="2">Total sheets:</td></tr><tr><td colspan="3"></td><td>08-10-2014</td><td></td><td>KAJU</td><td>43000001;43000002</td><td colspan="2">12</td></tr></table> | | | | | | |  | | | Project: | | Function description: | Sheet: | Next sheet: | | DV Control system | | | 45 | 46 | | | | | Date: | Rev.: | Init.: | Drawing no.: | Total sheets: | | | | | 08-10-2014 | | KAJU | 43000001;43000002 | 12 | |
|  | | | Project: | | Function description: | Sheet: | | | | Next sheet: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | DV Control system | | | 45 | 46 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Date: | Rev.: | Init.: | Drawing no.: | Total sheets: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 08-10-2014 | | KAJU | 43000001;43000002 | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

List of Cable Cores


| List of Cable Cores | | | | | | | | |
|--|------|--------------|-------------------|-------------------------|-----------------------|-------------------|---------------|-------------|
| Cablename (-) | Wire | Connection 1 | Connection 2 | Description | Sheet | Path | | |
| -W319 | 6 | =A1-X2:4 | -B8:8 | Electrical heating coil | 14 | 14.C | | |
| -W320 | 1 | =A1-X3:42 | =A1-M6:1 | Heating valve | 19 | 5.J | | |
| -W320 | 2 | =A1-X3:43 | =A1-M6:2 | Heating valve | 19 | 5.K | | |
| -W320 | 3 | =A1-X3:41 | =A1-M6:3 | Heating valve | 19 | 4.J | | |
| -W321 | 1 | =A1-X3:42 | =A1-M7:1 | Cooling valve | 19 | 11.J | | |
| -W321 | 2 | =A1-X3:43 | =A1-M7:2 | Cooling valve | 19 | 11.K | | |
| -W321 | 3 | =A1-X3:44 | =A1-M7:3 | Cooling valve | 19 | 11.J | | |
| -W322 | 1 | =A1-X5:36 | =A1-M8:1 | Bypass plate heating | 27 | 7.K | | |
| -W322 | 2 | =A1-X5:37 | =A1-M8:2 | Bypass plate heating | 27 | 7.K | | |
| -W322 | 3 | =A1-X5:35 | =A1-M8:3 | Bypass plate heating | 27 | 7.K | | |
| -W328 | 1 | =A1-X3:10 | =A1-DVU:7 | DVU Control | 13 | 11.C | | |
| -W328 | 2 | =A1-X3:9 | =A1-DVU:8 | DVU Control | 13 | 11.F | | |
| -W328 | 3 | =A1-K3:14 | =A1-DVU:3 | DVU Control | 20 | 4.J | | |
| -W328 | 4 | =A1-K3:11 | =A1-DVU:4 | DVU Control | 20 | 4.J | | |
| -W328 | 5 | =A1-X3:44 | =A1-DVU:5 | DVU Control | 19 | 13.J | | |
| -W328 | 6 | =A1-X3:42 | =A1-DVU:6 | DVU Control | 19 | 13.J | | |
| -W329 | 1 | =A1-F2:1 | =A1-DVU L1 | DVU supply | 10 | 17.J | | |
| -W329 | 2 | =A1-F2:3 | =A1-DVU L2 | DVU supply | 10 | 17.J | | |
| -W329 | 3 | =A1-F2:5 | =A1-DVU L3 | DVU supply | 10 | 18.J | | |
| -W329 | 4 | =A1-F2:N | =A1-DVU N | DVU supply | 10 | 18.J | | |
|  | | | Project: | | Function description: | | Sheet: | Next sheet: |
| | | | DV Control system | | | | 46 | 47 |
| | | | Date: | Rev.: | Init.: | Drawing no.: | Total sheets: | |
| | | | 08-10-2014 | | KAJU | 43000001;43000002 | 12 | |

List of Cable Cores

| List of Cable Cores | | | | | | | |
|--|------|--------------|--------------|--------------------------------|-------|------|--|
| Cablename (-) | Wire | Connection 1 | Connection 2 | Description | Sheet | Path | |
| -W329 | 5 | =A1PE | =A1-DVU PE | DVU supply | 10 | 18.J | |
| -W330 | 1 | =A1-X5:29 | =A1-M3:1 | Supply air damper on/off | 26 | 5.K | |
| -W330 | 2 | =A1-X5:28 | =A1-M3:2 | Supply air damper on/off | 26 | 5.K | |
| -W330 | 3 | =A1-X5:30 | =A1-M3:3 | Supply air damper on/off | 26 | 5.K | |
| -W330S | 1 | =A1-X5:29 | =A1-M3s:1 | Supply air damper springreturn | 26 | 8.K | |
| -W330S | 2 | =A1-X5:30 | =A1-M3s:2 | Supply air damper springreturn | 26 | 8.K | |
| -W331 | 1 | =A1-X3:35 | =A1-M4:1 | Extract air damper on/off | 18 | 1.J | |
| -W331 | 2 | =A1-X3:34 | =A1-M4:2 | Extract air damper on/off | 18 | 2.J | |
| -W331 | 3 | =A1-X3:33 | =A1-M4:3 | Extract air damper on/off | 18 | 2.J | |
| -W331S | 1 | =A1-X3:35 | =A1-M4s:1 | Extract air damper spring | 18 | 4.J | |
| -W331S | 2 | =A1-X3:33 | =A1-M4s:2 | Extract air damper spring | 18 | 4.J | |
| -W332 | 1 | =A1-X3:38 | =A1-M11:1 | Rec mix damper | 18 | 12.J | |
| -W332 | 2 | =A1-X3:39 | =A1-M11:2 | Rec mix damper | 18 | 12.J | |
| -W332 | 3 | =A1-X3:37 | =A1-M11:3 | Rec mix damper | 18 | 12.J | |
| -W332s | 1 | =A1-X3:38 | =A1-M11s:1 | | 18 | 14.J | |
| -W332s | 2 | =A1-X3:37 | =A1-M11s:2 | | 18 | 15.J | |
| -W333 | 1 | =A1-X5:33 | =A1-M9:1 | Supply air mix damper | 26 | 11.J | |
| -W333 | 2 | =A1-X5:32 | =A1-M9:2 | Supply air mix damper | 26 | 11.J | |
| -W333 | 3 | =A1-X5:31 | =A1-M9:3 | Supply air mix damper | 26 | 11.J | |
| -W334 | 1 | =A1-X3:35 | =A1-M10:1 | mix extract damper on/off | 18 | 6.J | |
| <div><div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div></div><div></div><div></div><div></div><div></div><div></div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div></div><div></div><div></div><div></div><div></div><div></div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> 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List of Cable Cores

| List of Cable Cores | | | | | | |
|---------------------|------|--------------|----------------|-------------------------------|-------|------|
| Cablename (-) | Wire | Connection 1 | Connection 2 | Description | Sheet | Path |
| -W334 | 2 | =A1-X3:34 | =A1-M10:2 | mix extract damper on/off | 18 | 7.J |
| -W334 | 3 | =A1-X3:36 | =A1-M10:3 | mix extract damper on/off | 18 | 7.J |
| -W334s | 1 | =A1-X3:35 | =A1-M10s:1 | Mix extract damper spring | 18 | 9.J |
| -W334s | 2 | =A1-X3:36 | =A1-M10s:2 | Mix extract damper spring | 18 | 9.J |
| -W340 | 1 | =A1-X3:27 | =A1-P4:24V | Pressure extract air external | 16 | 3.C |
| -W340 | 2 | =A1-X3:25 | =A1-P4:0-10V | Pressure extract air external | 16 | 2.C |
| -W340 | 3 | =A1-X3:26 | =A1-P4:ANG | Pressure extract air external | 16 | 2.C |
| -W341 | 1 | =A1-X3:31 | =A1-P3:24V | Pressure supply external | 16 | 15.C |
| -W341 | 2 | =A1-X3:32 | =A1-P3:0-10V | Pressure supply external | 16 | 15.C |
| -W341 | 3 | =A1-X3:30 | =A1-P3:ANG | Pressure supply external | 16 | 14.C |
| -W350 | 1 | =A1-X3:27 | =A1-P1:24V | Flow measuring supply | 16 | 7.C |
| -W350 | 2 | =A1-X3:28 | =A1-P1:0-10V | Flow measuring supply | 16 | 6.C |
| -W350 | 3 | =A1-X3:26 | =A1-P1:ANG | Flow measuring supply | 16 | 6.C |
| -W351 | 1 | =A1-X5:28 | =A1-P2:24V | Flow measuring extract | 25 | 15.C |
| -W351 | 2 | =A1-X5:27 | =A1-P2:0-10V | Flow measuring extract | 25 | 14.C |
| -W351 | 3 | =A1-X5:29 | =A1-P2:ANG | Flow measuring extract | 25 | 14.C |
| -W352 | 1 | =A1-X5:25 | =A1-P6:24V | Humidity sensor supplyair | 25 | 11.C |
| -W352 | 2 | =A1-X5:26 | =A1-P6:0-10V | Humidity sensor supplyair | 25 | 10.C |
| -W352 | 3 | =A1-X5:24 | =A1-P6:ANG | Humidity sensor supplyair | 25 | 10.C |
| -W353 | 1 | =A1-X5:14 | =A1-P9/-P5:24V | Humidity sensor external | 24 | 9.C |

| | | | | | | | | | | |
|--|--|--|-------------------|-------|-----------------------|-------------------|--------|---------------|-------------|--|
|  | | | Project: | | Function description: | | Sheet: | | Next sheet: | |
| | | | DV Control system | | | | 48 | | 49 | |
| | | | Date: | Rev.: | Init.: | Drawing no.: | | Total sheets: | | |
| | | | 08-10-2014 | | KAJU | 43000001;43000002 | | 12 | | |


List of Cable Cores

| List of Cable Cores | | | | | | |
|---------------------|------|--------------|------------------|----------------------------|-------|------|
| Cablename (-) | Wire | Connection 1 | Connection 2 | Description | Sheet | Path |
| -W353 | 2 | =A1-X5:16 | =A1-P9/-P5:0-10V | Humidity sensor external | 24 | 8.C |
| -W353 | 3 | =A1-X5:15 | =A1-P9/-P5:ANG | Humidity sensor external | 24 | 8.C |
| -W354 | 1 | =A1-X3:31 | =A1-P7/-P8:24V | CO2 Sensor | 16 | 11.C |
| -W354 | 2 | =A1-X3:29 | =A1-P7/-P8:0-10V | CO2 Sensor | 16 | 11.C |
| -W354 | 3 | =A1-X3:30 | =A1-P7/-P8:ANG | CO2 Sensor | 16 | 10.C |
| -W360 | 1 | =A1-X5:21 | =A1-R7 | Room sensor no.1 | 25 | 2.C |
| -W360 | 2 | =A1-X5:22 | =A1-R7 | Room sensor no.1 | 25 | 2.C |
| -W361 | 1 | =A1-X5:24 | =A1-R8 | Room sensor no.2 | 25 | 5.C |
| -W361 | 2 | =A1-X5:23 | =A1-R8 | Room sensor no.2 | 25 | 5.C |
| -W363 | 1 | =A1-X3:23 | =A1-R9 | Outdoor sensor | 15 | 11.C |
| -W363 | 2 | =A1-X3:22 | =A1-R9 | Outdoor sensor | 15 | 11.C |
| -W365 | 1 | =A1-R10 | =A1-X5:24 | Pre-heat temperatur sensor | 25 | 7.C |
| -W365 | 2 | =A1-R10 | =A1-X5:23 | Pre-heat temperatur sensor | 25 | 8.C |
| -W371 | 1 | =A1-X3:39 | =A1-B7:1 | Capilarsensor | 18 | 17.B |
| -W371 | 2 | =A1-X3:50 | =A1-B7:4 | Capilarsensor | 18 | 17.D |
| -W371.1 | 1 | =A1-B8:1 | =A1-X3:50 | Capilarsensor bulb | 18 | 17.E |
| -W371.1 | 2 | =A1-X3:40 | =A1-B8:4 | Capilarsensor bulb | 18 | 17.F |
| -W380 | 1 | =A1-X3:10 | =A1-S2 | Reduced speed | 13 | 15.C |
| -W380 | 2 | =A1-X3:11 | =A1-S2 | Reduced speed | 13 | 15.E |
| -W381 | 1 | =A1-X3:13 | =A1-S10 | Normal speed | 13 | 17.C |

| | | | | | | | | | | |
|--|--|--|-------------------|-------|----------------------|-------------------|--------|---------------|-------------|--|
|  | | | Project: | | Function decription: | | Sheet: | | Next sheet: | |
| | | | DV Control system | | | | 49 | | 50 | |
| | | | Date: | Rev.: | Init.: | Drawing no.: | | Total sheets: | | |
| | | | 08-10-2014 | | KAJU | 43000001;43000002 | | 12 | | |

List of Cable Cores

| List of Cable Cores | | | | | | |
|---------------------|------|--------------|--------------|--------------------|-------|------|
| Cablename (-) | Wire | Connection 1 | Connection 2 | Description | Sheet | Path |
| -W381 | 2 | =A1-X3:12 | =A1-S10 | Normal speed | 13 | 17.E |
| -W390 | 1 | =A1-X5:35 | =A1-T110:12 | Rot. heat recovery | 27 | 4.K |
| -W390 | 2 | =A1-X5:36 | =A1-T110:13 | Rot. heat recovery | 27 | 5.K |
| -W390 | 3 | =A1-X5:10 | =A1-T110:9 | Rot. heat recovery | 23 | 12.D |
| -W390 | 4 | =A1-X5:11 | =A1-T110:10 | Rot. heat recovery | 23 | 12.D |
| -W700 | 1 | =A1-X2:5 | =A1-S1 | Light switch | 11 | 8.J |
| -W700 | 2 | =A1-X2:6 | =A1-S1 | Light switch | 11 | 9.J |
| -W701.1 | 1 | =A1-X2:7 | =A1-E1.1:L1 | Light P20 | 11 | 11.J |
| -W701.1 | 2 | =A1-X2:8 | =A1-E1.1:N | Light P20 | 11 | 11.J |
| -W701.2 | 1 | =A1-E1.1:L1 | =A1-E1.2:L1 | Light P20 | 11 | 12.K |
| -W701.2 | 2 | =A1-E1.1:N | =A1-E1.2:N | Light P20 | 11 | 12.K |
| -W701.3 | 1 | =A1-E1.2:L1 | =A1-E1.3:L1 | Light P20 | 11 | 13.L |
| -W701.3 | 2 | =A1-E1.2:N | =A1-E1.3:N | Light P20 | 11 | 13.L |
| -W702.1 | 1 | =A1-X2:8 | =A1-E2.1:L1 | Light P21 | 11 | 15.J |
| -W702.1 | 2 | =A1-X2:9 | =A1-E2.1:N | Light P21 | 11 | 16.J |
| -W702.2 | 1 | =A1-E2.1:L1 | =A1-E2.2:L1 | | 11 | 17.K |
| -W702.2 | 2 | =A1-E2.1:N | =A1-E2.2:N | | 11 | 17.K |
| -W702.3 | 1 | =A1-E2.2:L1 | =A1-E2.3:L1 | | 11 | 18.L |
| -W702.3 | 2 | =A1-E2.2:N | =A1-E2.3:N | | 11 | 18.L |
| -W900 | 1 | =A1-X5:38 | -B9:1 | Pre-heating | 27 | 11.J |

| | | | | | | | | | | |
|--|--|--|-------------------|-------|-----------------------|-------------------|--------|---------------|-------------|--|
|  | | | Project: | | Function description: | | Sheet: | | Next sheet: | |
| | | | DV Control system | | | | 50 | | 51 | |
| | | | Date: | Rev.: | Init.: | Drawing no.: | | Total sheets: | | |
| | | | 08-10-2014 | | KAJU | 43000001;43000002 | | 12 | | |

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List of PLC I/O

| Function (=) | Location (+) | PLC (-) | Operand | Symbol Address | Comment | Con. No. | MODBUS | BACKnet | Connection | Sheet | Cell |
|--|--------------|---------|---------|----------------------|---------------------|-------------------|---------|-----------------------|------------|--------------------------------|-----------------|
| =A1 | | —C1 | A11:31 | Temperature sensor | Extract air | A11 | 3x00001 | VI—1234567 | =A1—X3:19 | 15 | 3.I |
| =A1 | | —C1 | A12:32 | Temperature sensor | Supply air | A12 | 3x00001 | VI—1234567 | =A1—X3:21 | 15 | 7.I |
| =A1 | | —C1 | A13:34 | Temperature sensor | Outdoor air | A13 | 3x00001 | VI—1234567 | =A1—X3:22 | 15 | 11.I |
| =A1 | | —C1 | A14:35 | Temperature sensor | Frost protection Y1 | A14 | 3x00001 | VI—1234567 | =A1—X3:24 | 15 | 15.I |
| =A1 | | —C1 | A01:91 | Speed | Supply air | A01 | 3x00001 | VI—1234567 | =A1—X3:7 | 19 | 2.D |
| =A1 | | —C1 | A02:92 | Heating coil Y1 | Capacity | A02 | 3x00001 | VI—1234567 | =A1—X3:41 | 19 | 4.D |
| =A1 | | —C1 | A03:93 | Cooling / changeover | Capacity | A03 | 3x00001 | VI—1234567 | =A1—X3:44 | 19 | 11.D |
| =A1 | | —C1 | A04:94 | Recirculation | Capacity | A04 | 3x00001 | VI—1234567 | =A1—K9:12 | 19 | 13.D |
| =A1 | | —C1 | D11:71 | Filter guard | Extract air | D11 | 3x00001 | VI—1234567 | =A1—X3:1 | 13 | 2.I |
| =A1 | | —C1 | D12:72 | Ready supply fan | | D12 | 3x00001 | VI—1234567 | =A1—X3:6 | 13 | 5.I |
| =A1 | | —C1 | D13:73 | Cooling alarm | | D13 | 3x00001 | VI—1234567 | =A1—X3:9 | 13 | 11.I |
| =A1 | | —C1 | D14:74 | Frost thermostat | | D14 | 3x00001 | VI—1234567 | =A1—K5:14 | 13 | 13.I |
| =A1 | | —C1 | D15:75 | Reduced speed | or stop unit | D15 | 3x00001 | VI—1234567 | =A1—X3:11 | 13 | 15.I |
| =A1 | | —C1 | D16:76 | Normal speed | Start unit | D16 | 3x00001 | VI—1234567 | =A1—X3:12 | 13 | 17.I |
| =A1 | | —C1 | D17:77 | Fire signal | | D17 | 3x00001 | VI—1234567 | =A1—X3:15 | 14 | 2.I |
| =A1 | | —C1 | D18:78 | Electrical heater | | D18 | 3x00001 | VI—1234567 | =A1—X3:18 | 14 | 12.I |
| =A1 | | —C1 | D01:11 | Fan supply air | Start | D01 | 3x00001 | VI—1234567 | =A1—K1:A2 | 17 | 2.D |
| =A1 | | —C1 | D02:12 | Start heating pump | | D02 | 3x00001 | VI—1234567 | =A1—K2:A2 | 17 | 4.D |
| =A1 | | —C1 | D03:13 | Start cooling | | D03 | 3x00001 | VI—1234567 | =A1—K3:A2 | 17 | 6.D |
| =A1 | | —C1 | D04:14 | Alarm signal | | D04 | 3x00001 | VI—1234567 | =A1—K4:A2 | 17 | 8.D |
| =A1 | | —C1 | D05:15 | Damper motor | Extract air | D05 | 3x00001 | VI—1234567 | =A1—K8:A2 | 17 | 11.D |
| =A1 | | —C1 | D06:16 | Rec damper | Start | D07 | 3x00001 | VI—1234567 | =A1—K9:A2 | 17 | 13.D |
| =A1 | | —C1 | U11:41 | Pressure transmitter | Extract air | U11 | 3x00001 | VI—1234567 | =A1—X3:25 | 16 | 2.I |
| =A1 | | —C1 | U12:42 | Flow measuring | Supply air fan | U12 | 3x00001 | VI—1234567 | =A1—X3:28 | 16 | 6.I |
| =A1 | | —C1 | U13:44 | CO2 sensor | Extract air or Room | U13 | 3x00001 | VI—1234567 | =A1—X3:29 | 16 | 11.I |
| =A1 | | —C1 | U14:45 | Pressure transmitter | Supply air Duct | U14 | 3x00001 | VI—1234567 | =A1—X3:32 | 16 | 15.I |
| =A1 | | —C2 | A11:31 | Temperature sensor | Intake | A11 | 3x00001 | VI—1234567 | =A1—X5:17 | 24 | 2.I |
| =A1 | | —C2 | A12:32 | Temperature sensor | Deicing | A12 | 3x00001 | VI—1234567 | =A1—X5:19 | 24 | 5.I |
| =A1 | | —C2 | A13:34 | Humidity sensor | Room / Extract | A13 | 3x00001 | VI—1234567 | =A1—X5:16 | 24 | 8.I |
| =A1 | | —C2 | A14:35 | Temperatur sensor | Exhaust | A14 | 3x00001 | VI—1234567 | =A1—X5:20 | 24 | 12.I |
|  | | | | Project: | | DV Control system | | Function description: | | Sheet: | Next sheet: |
| | | | | Date: | 13—10—2014 | Rev.: | | Init.: | KAJU | Drawing no.: 43000001;43000002 | Total sheets: 2 |

List of PLC I/O

| Function (=) | Location (+) | PLC (-) | Operand | Symbol Address | Comment | Con. No. | MODBUS | BACKnet | Connection | Sheet | Cell | |
|--|--------------|---------|---------|---------------------|-----------------------|-------------------|---------|-----------------------|------------|--------------------------------|------|-----------------|
| =A1 | | -C2 | A01:91 | Speed | Extract air | A01 | 3x00001 | VI-1234567 | =A1-X5:8 | 27 | 2.D | |
| =A1 | | -C2 | A02:92 | Heat recovery | capacity | A02 | 3x00001 | VI-1234567 | =A1-X5:35 | 27 | 4.D | |
| =A1 | | -C2 | A03:93 | Split | Y2 | A03 | 3x00001 | VI-1234567 | =A1-K7:24 | 27 | 9.D | |
| =A1 | | -C2 | A04:94 | Preheater | | A04 | 3x00001 | VI-1234567 | =A1-X5:39 | 27 | 13.D | |
| =A1 | | -C2 | DI1:71 | Filter guard | Extract air | DI1 | 3x00001 | VI-1234567 | =A1-X5:3 | 23 | 2.I | |
| =A1 | | -C2 | DI2:72 | Ready extract fan | | DI2 | 3x00001 | VI-1234567 | =A1-X5:7 | 23 | 5.I | |
| =A1 | | -C2 | DI3:73 | Rot. heat exchanger | | DI3 | 3x00001 | VI-1234567 | =A1-X5:10 | 23 | 12.I | |
| =A1 | | -C2 | DI4:74 | Electrical Preheat | overheat | DI4 | 3x00001 | VI-1234567 | =A1-X5:38 | 23 | 14.I | |
| =A1 | | -C2 | DI5:75 | Change over | | DI5 | 3x00001 | VI-1234567 | =A1-X5:12 | 23 | 16.I | |
| =A1 | | -C2 | DI6:76 | Recirculation ON | | DI6 | 3x00001 | VI-1234567 | =A1-X5:13 | 23 | 18.I | |
| =A1 | | -C2 | DO1:11 | Fan extract | Start | DO1 | 3x00001 | VI-1234567 | =A1-K6:A2 | 26 | 1.D | |
| =A1 | | -C2 | DO2:12 | Damper supply air | | DO2 | 3x00001 | VI-1234567 | =A1-K7:A2 | 26 | 3.D | |
| =A1 | | -C2 | DO3:13 | Circulation pump | Start | DO3 | 3x00001 | VI-1234567 | =A1-X5:34 | 26 | 13.D | |
| =A1 | | -C2 | DO4:14 | Preheating | Start | DO4 | 3x00001 | VI-1234567 | =A1-K10:A2 | 26 | 15.D | |
| =A1 | | -C2 | UI1:41 | Room sensor 1 | | UI1 | 3x00001 | VI-1234567 | =A1-X5:22 | 25 | 2.I | |
| =A1 | | -C2 | UI2:42 | Room sensor 2 | Preheating temperatur | UI2 | 3x00001 | VI-1234567 | =A1-X5:23 | 25 | 5.I | |
| =A1 | | -C2 | UI3:44 | Humidity sensor | Intake | UI3 | 3x00001 | VI-1234567 | =A1-X5:26 | 25 | 10.I | |
| =A1 | | -C2 | UI4:45 | Flow measuring | Extract air fan | UI4 | 3x00001 | VI-1234567 | =A1-X5:27 | 25 | 14.I | |
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|  | | | | Project: | | DV Control system | | Function description: | | Sheet: | 2 | Next sheet: |
| | | | | Date: | 13-10-2014 | Rev.: | | Init.: | KAJU | Drawing no.: 43000001;43000002 | | Total sheets: 2 |

Terminal Strip:
-X1



Terminal Strip:
-X2

| | | | | | | | |
|--|--|-----|---|---------------|-----------|----------|------------|
|  | | -X2 | Project: DV Control system Drawing No.: 43000001;43000002 Rev: 02.13 Date: 08-10-2014 | | | | min.: KAJU |
| | | | Date: | Function: =A1 | Location: | Page: 61 | |

Terminal Strip:
-X3

[illegible]

[illegible]

Terminal Strip:
-X5

Terminal Strip:
-X5

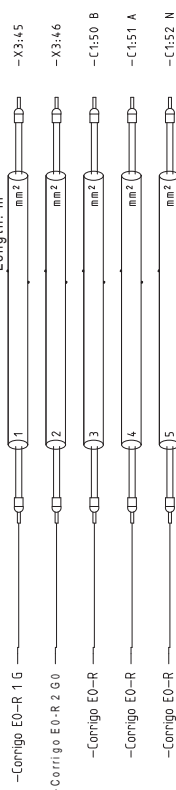


=A1-W90

Description: Remote panel

Type: Not delivered

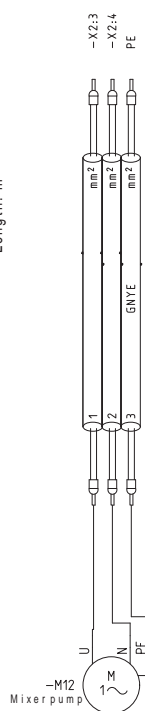
Dimension:
Length: m



Description: Mixing pump

Type: Y-OZ

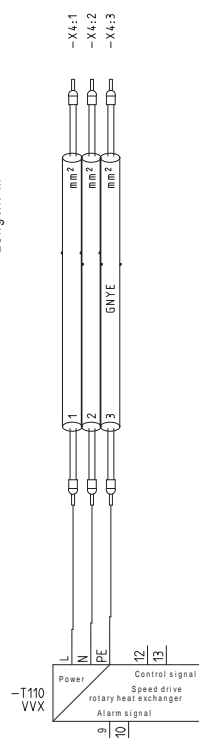
Dimension:
Length: m



Description: VVX Power

Type: Y-OZ

Dimension:
Length: m

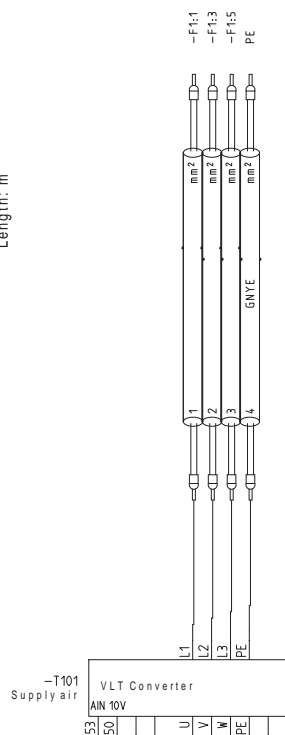
[illegible]

=A1-W101.1

Description: VLT Supplyair

Type: Y-OZ

Dimension:
Length: m

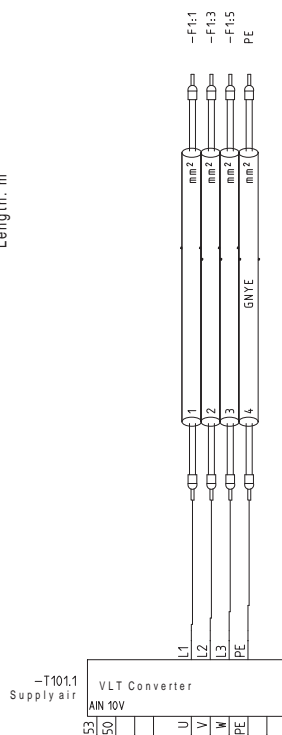


=A1-W101.1.2

Description: VLT Supplyair

Type: Y-OZ

Dimension:
Length: m

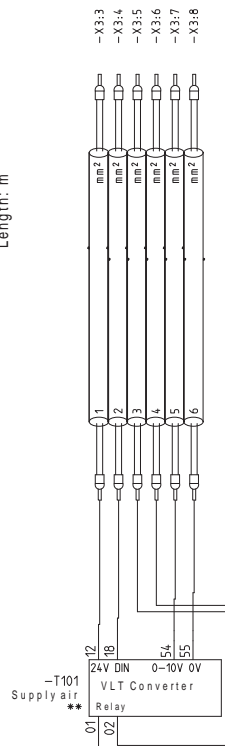


=A1-W1012.

Description: VLT control supply

Type: Y-OZ

Dimension:
Length: m

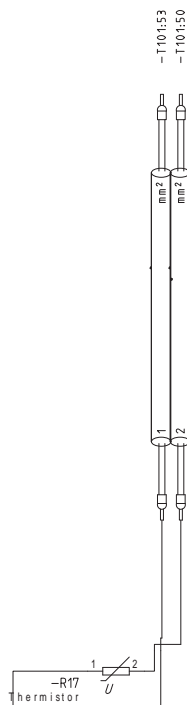
[illegible]

Cabelplan

$$=A1-W101.4$$

Description: Supply thermistor

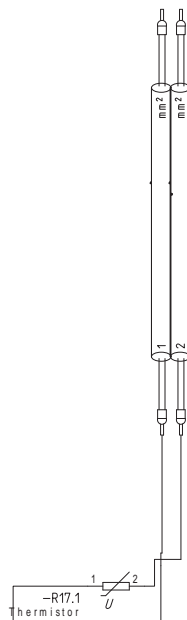
Type: Y-OZ
Dimension:
Length: m



=A1-W1014.1

Description: Supply thermistor

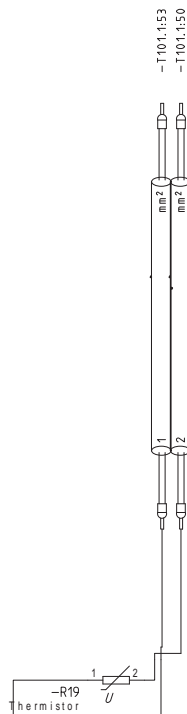
Type: Y-OZ
Dimension:
Length: m



=A1-W1014.2

Description: Supply thermistor

Type: Y-OZ
Dimension:
Length: m

[illegible]

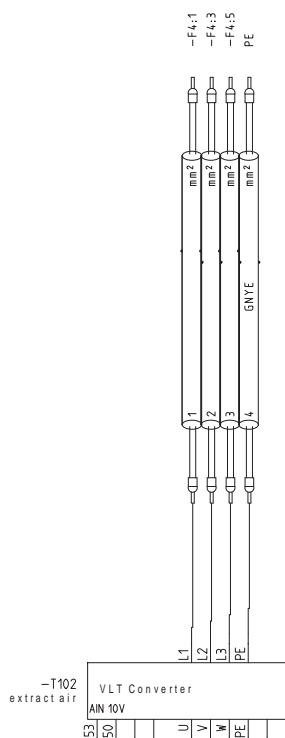
$$=A1-W102.1$$

Description: VLT extract power

Type: Y-07

Type: Y-UZ
Dimension:

Length: m



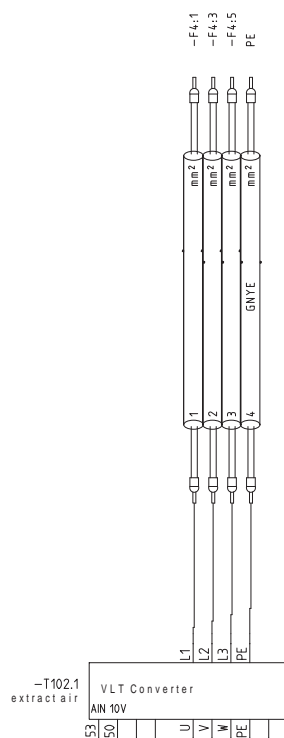
=A1-W102.12

Description: VLT extract power

Type: Y-OZ

Type: r-OZ
Dimension:

Length: m



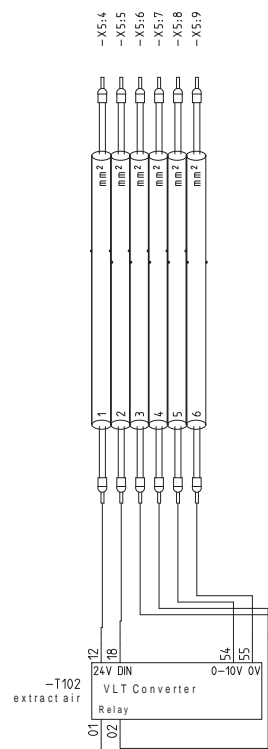
=A1-W102.2

Description: VLT control extract

Type:

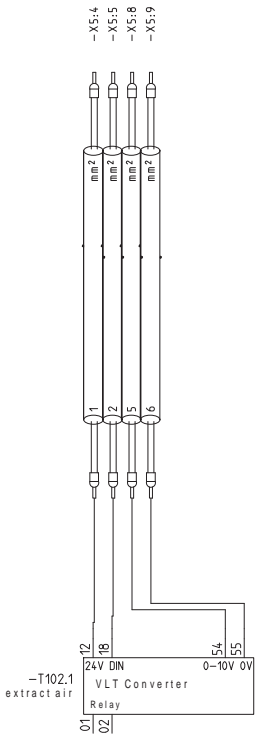
Type:
Dimension:

Length: m

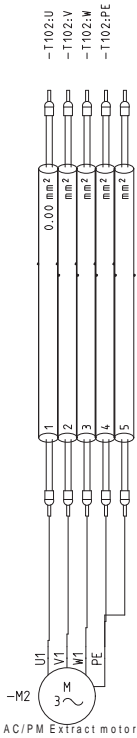
[illegible]

Cabelplan

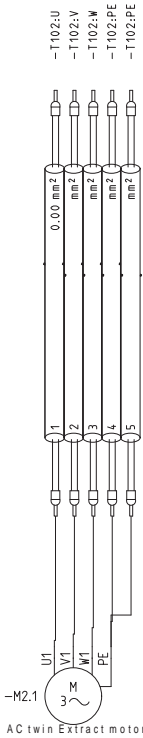
=A1-W102.2.2
Description: VLT control extract
Type:
Dimension:
Length: m



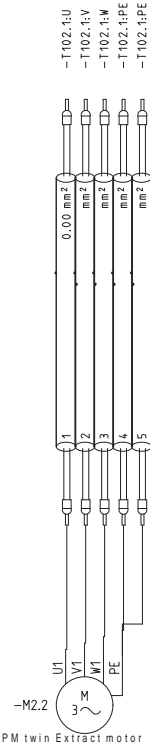
=A1-W102.3
Description: motorcable power
Type: Y-OZ
Dimension:
Length: m



=A1-W102.3.1
Description: motorcable power
Type: Y-OZ
Dimension:
Length: m



=A1-W102.3.2
Description: motorcable power
Type: Y-OZ
Dimension:
Length: m



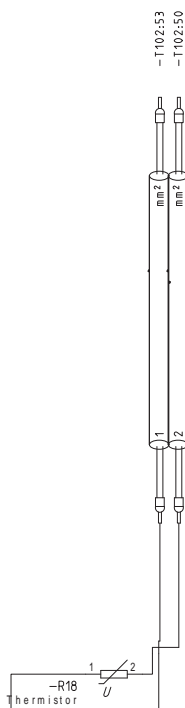
| Sheet | Path |
|-------|------|
| 23 | 8E |
| 23 | 8E |
| 23 | 10E |
| 23 | 10E |
| 23 | 10E |
| 21 | 3K |
| 21 | 3K |
| 21 | 3K |
| 21 | 3K |
| 21 | 4K |
| 21 | 6K |
| 21 | 7K |
| 21 | 7K |
| 21 | 7K |
| 21 | 7K |
| 21 | 11K |
| 21 | 11K |
| 21 | 11K |
| 21 | 12K |
| 21 | 12K |

Cabelplan

=A1-W102.4

Description: Extract thermistor

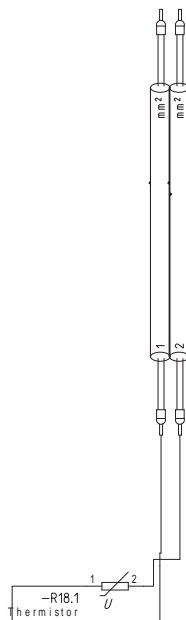
Type: Y-OZ
Dimension:
Length: m



=A1-W1024.1

Description: Extract thermistor

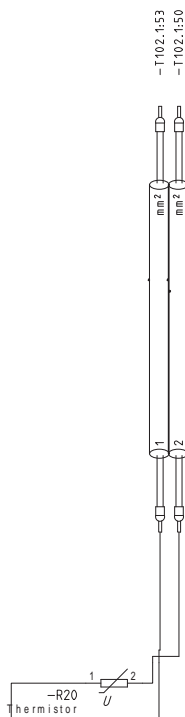
Type: Y-OZ
Dimension:
Length: m



=A1-W102.42

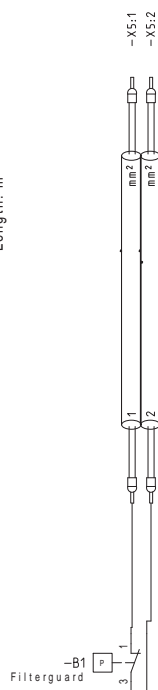
Description: Extract thermistor

Type: Y-OZ
Dimension:
Length: m

[illegible]

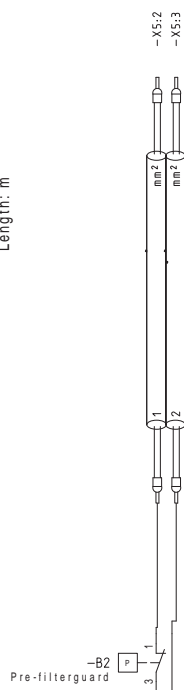
=A1-W301

Type:
Dimension:
Length: m



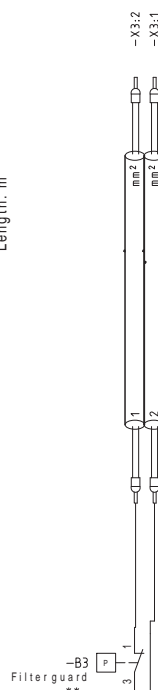
=A1-W301.1

Type:
Dimension:
Length: m



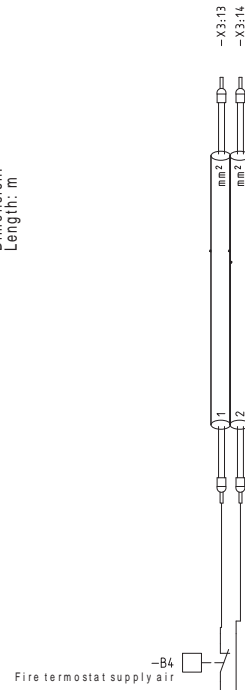
=A1-W302

Type: Y-OZ
Dimension:
Length: m



=A1-W304

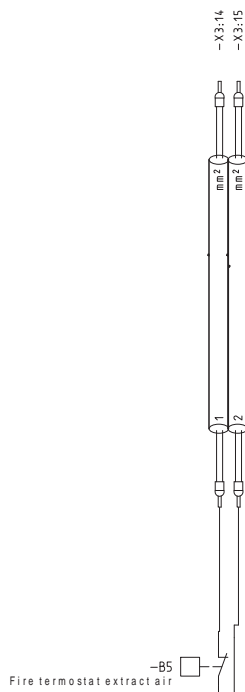
Description: Fire thermostat supply air
Type:
Dimension:
Length: m

[illegible]

=A1-W305

Description: Fire thermostat extract air

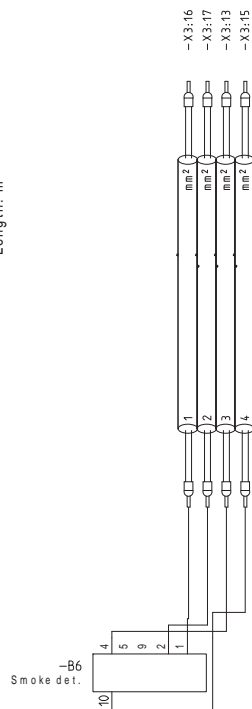
Type:
Dimension:
Length: m



=A1-W306

Description: Smokedetector

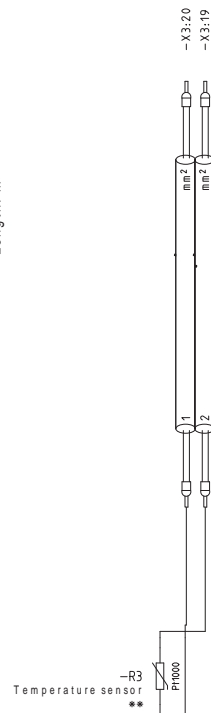
Type:
Dimension:
Length: m



=A1-W310

Description: Temperature sensor extract

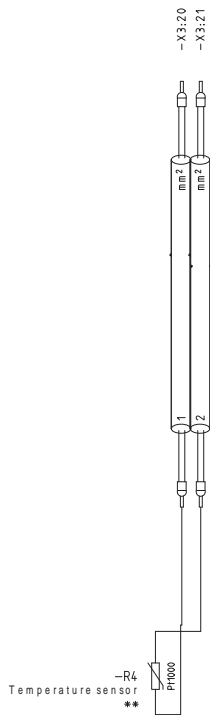
Type:
Dimension:
Length: m

[illegible]

=A1-W311

Description: Temperature sensor supply air

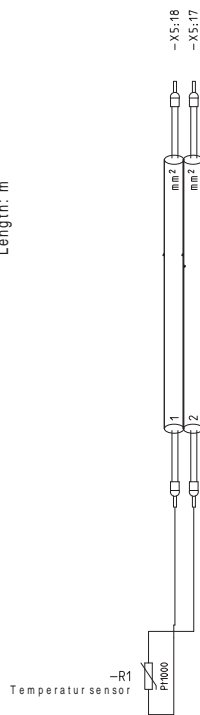
Type:
Dimension:
Length: m



=A1-W312

Description: Temperature sensor intake

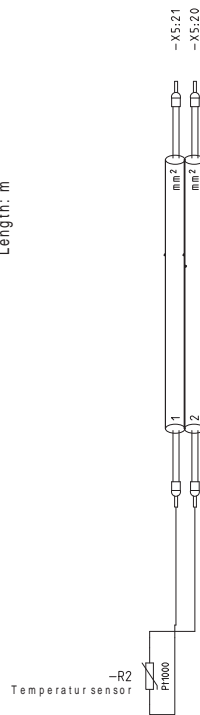
Type:
Dimension:
Length: m



=A1-W313

Description: Temperature sensor exhaust

Type:
Dimension:
Length: m

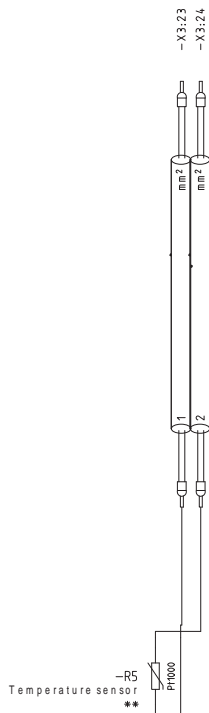
[illegible]

Cabelplan

=A1-W314

Description: Frost protection heating coil

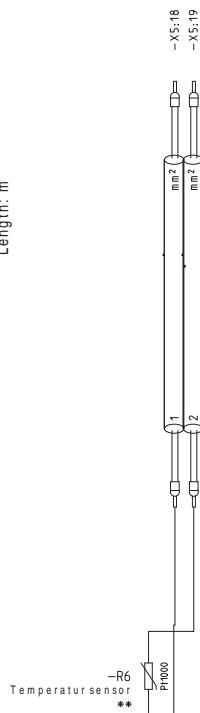
Type:
Dimension:
Length: m



=A1-W315

Description: Deicing for plate heat

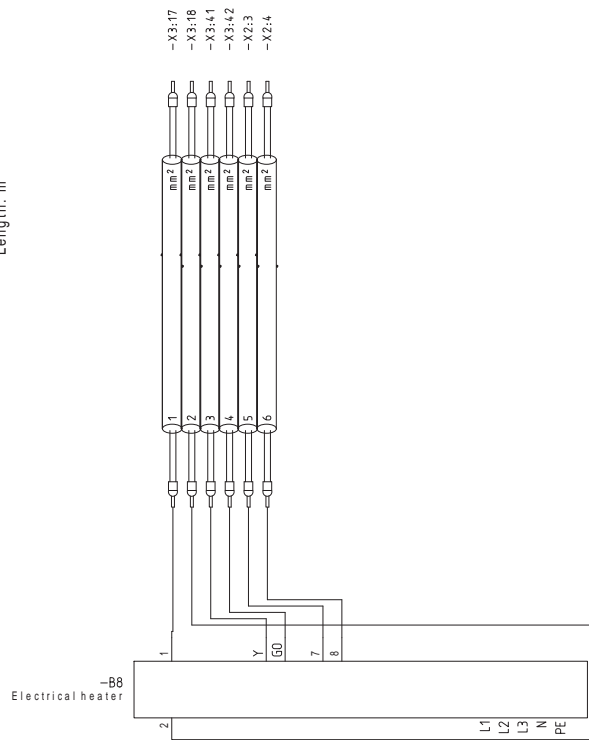
Type:
Dimension:
Length: m

[illegible]

=A1-W319

Description: Electrical heating coil

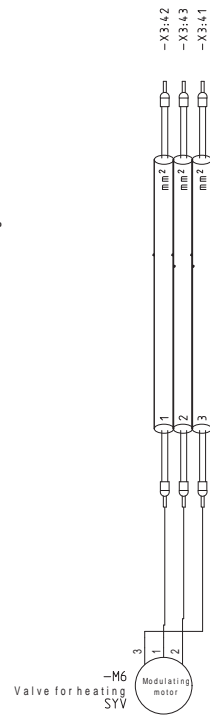
Type:
Dimension:
Length: m



=A1-W320

Description: Heating valve

Type: Y-OZ
Dimension:
Length: m

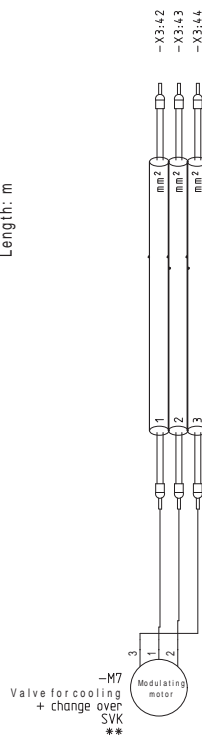
[illegible]

=A1-W321

Description: Cooling valve

Type: Y-OZ

Dimension:
Length: m

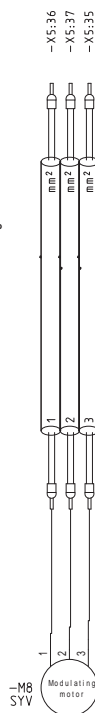


=A1-W322

Description: Bypass plate heating

Type: Y-OZ

Dimension:
Length: m

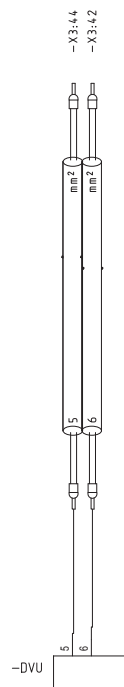
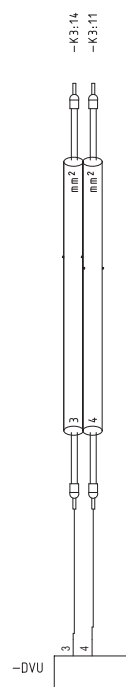
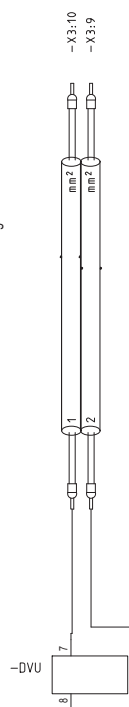


=A1-W328

Description: DVU Control

Type:

Dimension:
Length: m



=A1-W329

Description: DVU supply

Type: Y-OZ

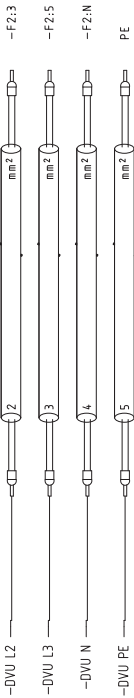
Dimension:
Length: m

[illegible]

=A1-W329

Description: DVU supply

Type: Y-OZ
Dimension:
Length: m



=A1-W330

Description: Supply air damper on/off

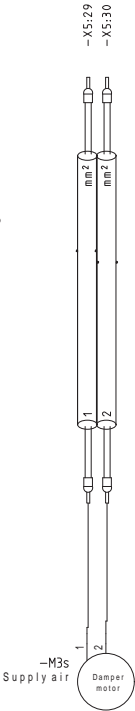
Type: Y-OZ
Dimension:
Length: m



=A1-W330S

Description: Supply air damper spring return

Type: Y-OZ
Dimension:
Length: m



=A1-W331

Description: Extract air damper on/off

Type: Y-OZ
Dimension:
Length: m

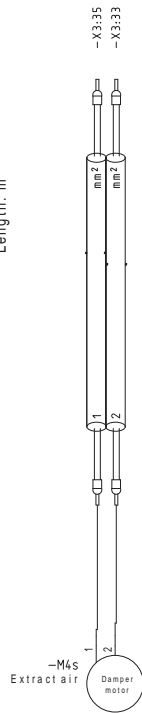


| Sheet | Path |
|-------|------|
| 10 | 77J |
| 10 | 18J |
| 10 | 18J |
| 10 | 18J |
| 10 | 18J |
| 26 | 5K |
| 26 | 5K |
| 26 | 5K |
| 26 | 8K |
| 26 | 8K |
| 18 | 1J |
| 18 | 2J |
| 18 | 2J |

=A1-W331S

Description: Extract air damper spring

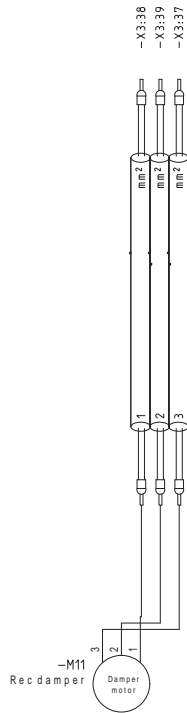
Type: Y-OZ
Dimension:
Length: m



=A1-W332

Description: Recmix damper

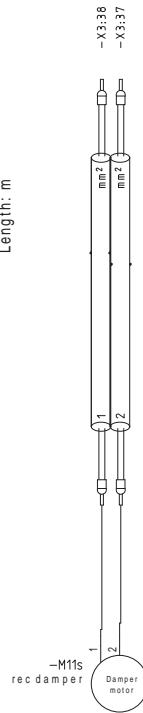
Type: Y-OZ
Dimension:
Length: m



=A1-W332S

Description:

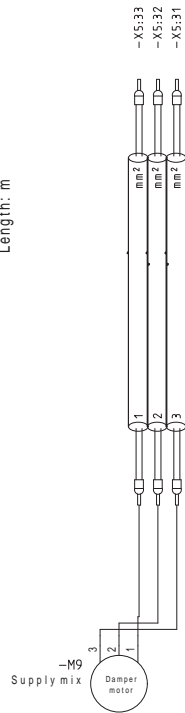
Type:
Dimension:
Length: m



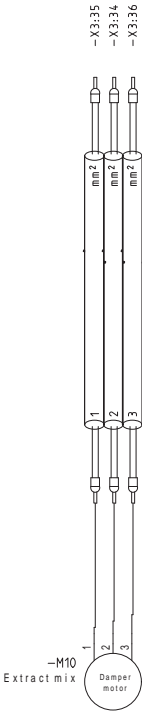
=A1-W333

Description: Supply air mix damper

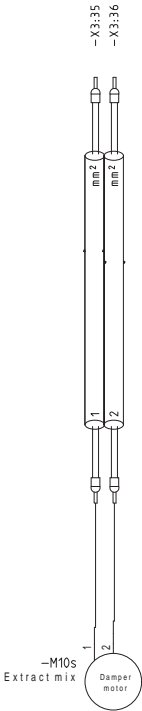
Type: Y-OZ
Dimension:
Length: m

[illegible]

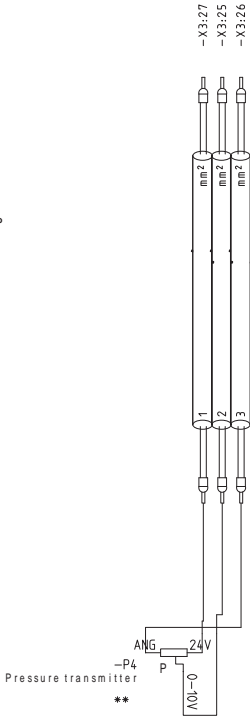
=A1-W334
Description: mix extract damper on/off
Type:
Dimension:
Length: m



=A1-W334S
Description: Mix extract damper spring
Type:
Dimension:
Length: m



=A1-W340
Description: Pressure extract air external
Type: Y-OZ
Dimension:
Length: m



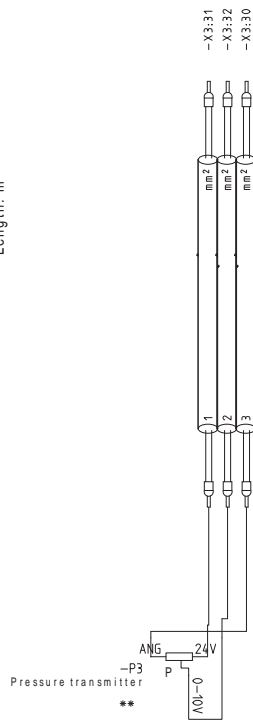
| Sheet | Path |
|-------|------|
| 18 | 6J |
| 18 | 7J |
| 18 | 7J |
| 18 | 9J |
| 18 | 9J |
| 16 | 3C |
| 16 | 2C |
| 16 | 2C |

| | | | |
|------------------------------|----------------|----------------------------------|-------------|
| Project DV Control system | Init.: KAJU | Rev.: 02.13 | Sheet 23 |
| Date 08-10-2014 | Funk | Dok. number 43000001;43000002 | Page 85 |

=A1-W341

Description: Pressure supply external

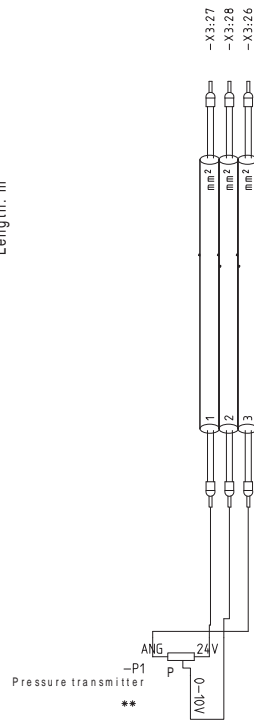
Type: Y-OZ
Dimension:
Length: m



=A1-W350

Description: Flow measuring supply

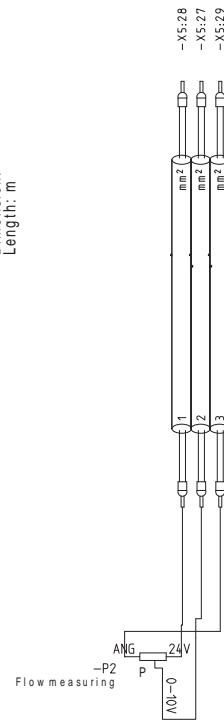
Type: Y-OZ
Dimension:
Length: m



=A1-W351

Description: Flow measuring extract

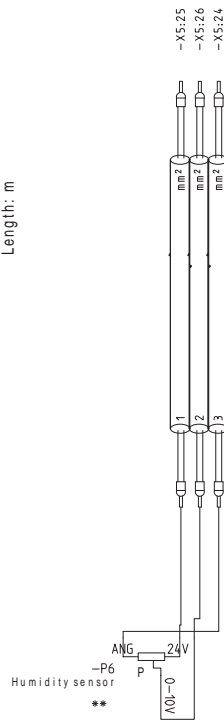
Type: Y-OZ
Dimension:
Length: m

[illegible]

Cabelplan

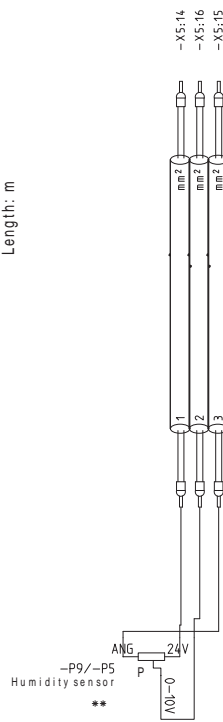
=A1-W352

Type: Y-OZ
Dimension:
Length: m



=A1-W353

Type: Y-OZ
Dimension:
Length: m

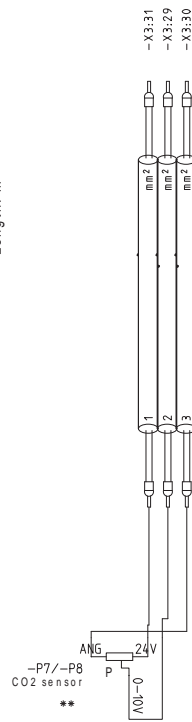


=A1-W354

Description: CO2 Sensor

Type: Y-OZ

Dimension:
Length: m

[illegible]

[illegible]

=A1-W365

Description: Pre-heat temperature sensor

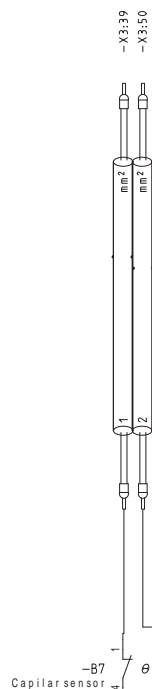
Type:
Dimension:
Length: m



=A1-W371

Description: Capilarsensor

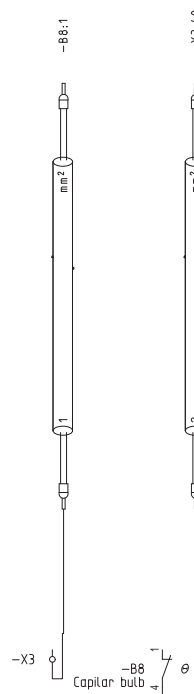
Type:
Dimension:
Length: m



=A1-W371.1

Description: Capilarsensor bulb

Type:
Dimension:
Length: m



=A1-W380

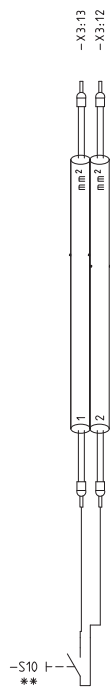
Description: Reduced speed

Type: Y-OZ
Dimension:
Length: m[illegible]

=A1-W381

Description: Normal speed

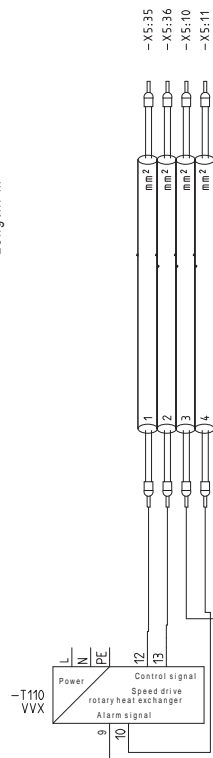
Type:
Dimension:
Length: m



=A1-W390

Description: Rot. heat recovery

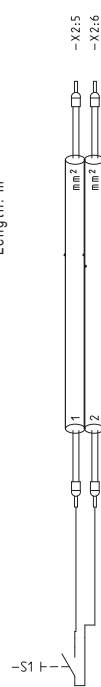
Type: Y-OZ
Dimension:
Length: m



=A1-W700

Description: Light switch

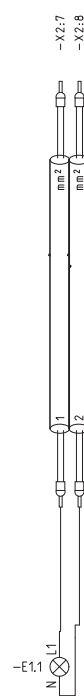
Type:
Dimension:
Length: m



=A1-W701.1

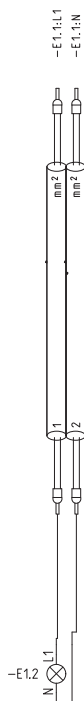
Description: Light P20

Type: Y-OZ
Dimension:
Length: m

[illegible]

Description: Light P20

Type: Y-OZ
Dimension:
Length: m



=A1-W7013

Description: Light P20

Type: Y-OZ
Dimension:
Length: m



=A1-W702.1

Description: Light P21

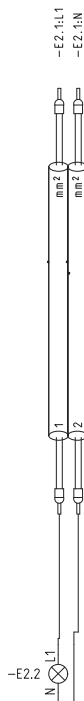
Type: Y-OZ
Dimension:
Length: m



=A1-W702.2

Description:

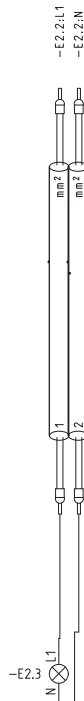
Type:
Dimension:
Length: m



=A1-W702.3

Description:

Type:
Dimension:
Length: m

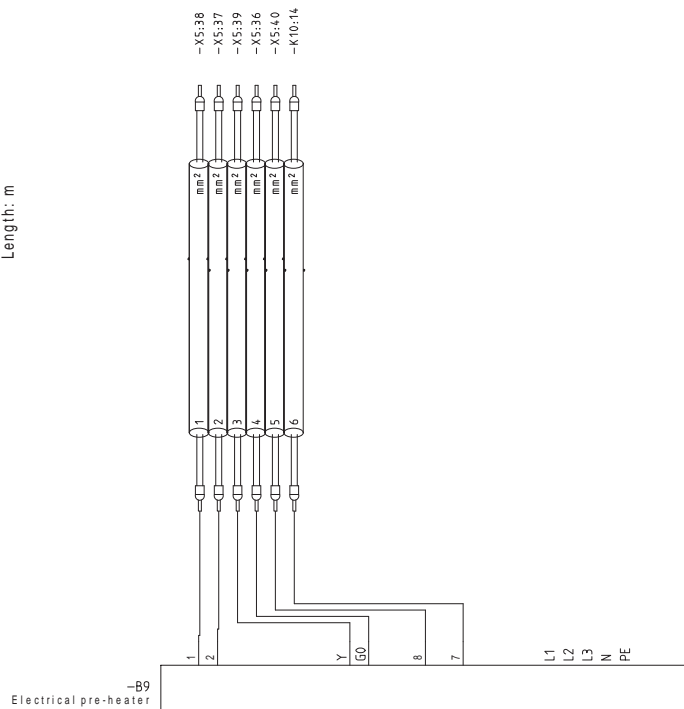
[illegible]

מבשר

=A1-W900

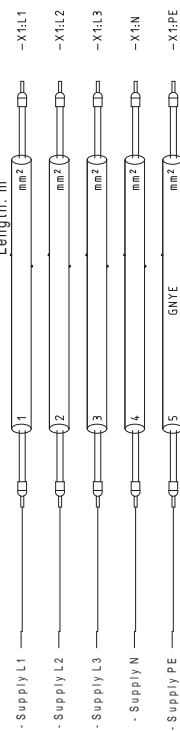
Description: Pre-heating

Type:
Dimension:
Length: m


$$=A1-W1000$$

Description: Main supply

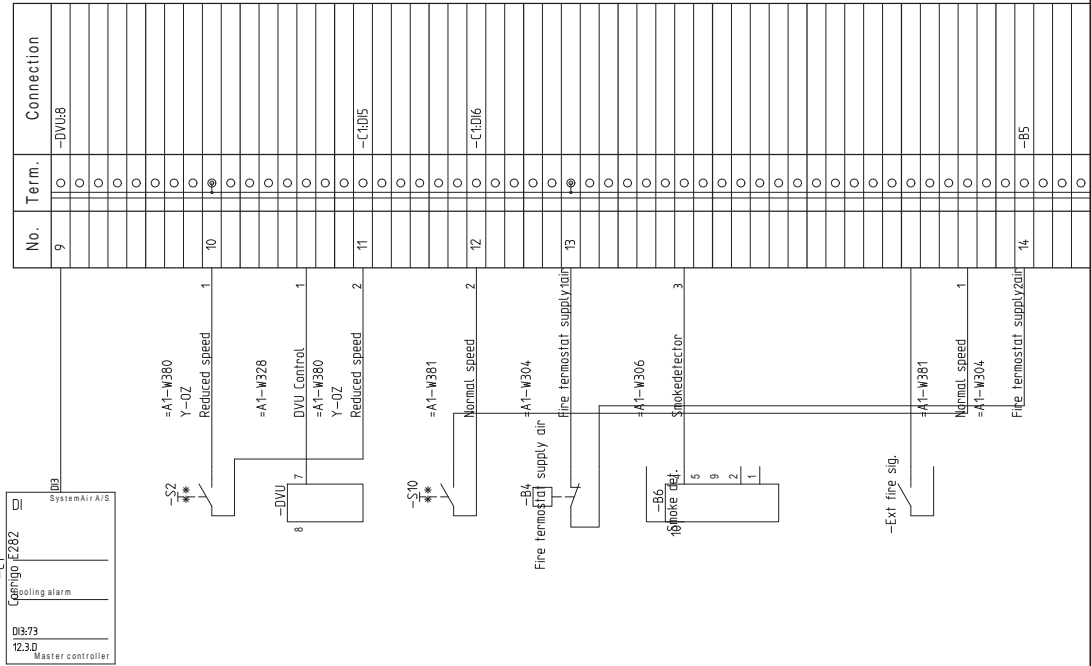
Type: Not delivered
Dimension:
Length: m



X1

Terminal Strip

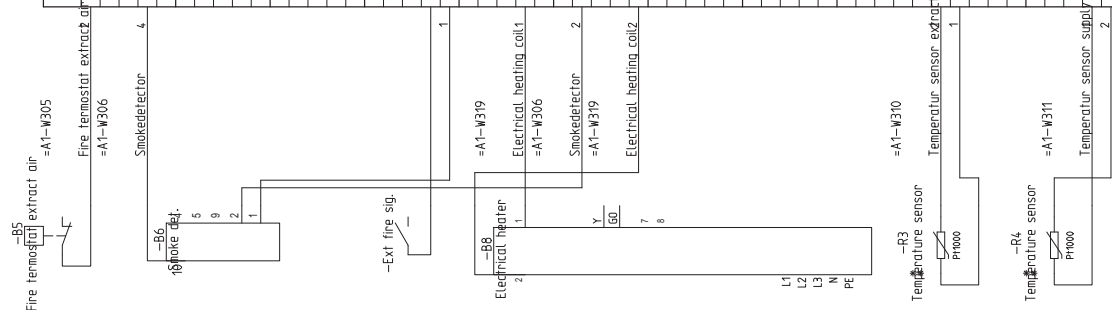
-X3



| Note | Cable type | Cable name | Path | Sheet |
|-----------------------------|------------|------------|-------|-------|
| Fire thermostat extract air | | =A1-W305 | 181.H | |
| DVU Control | | =A1-W328 | 185.B | |
| | | | 185.E | |
| | | | 187.E | |
| | | | 142.B | |
| | | | 142.D | |

| Note | Cable type | Cable name | Path | Sheet |
|-----------------------------|------------|------------|-------|-------|
| Fire thermostat extract air | | =A1-W305 | 181.H | |
| DVU Control | | =A1-W328 | 185.B | |
| | | | 185.E | |
| | | | 187.E | |
| | | | 142.B | |
| | | | 142.D | |

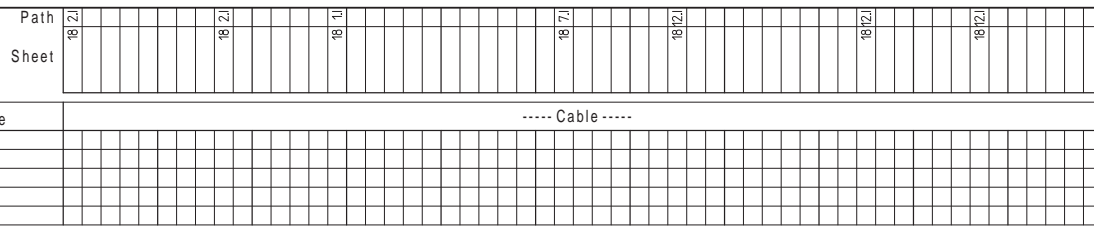
-X3

[illegible][illegible]

-X3

[illegible]

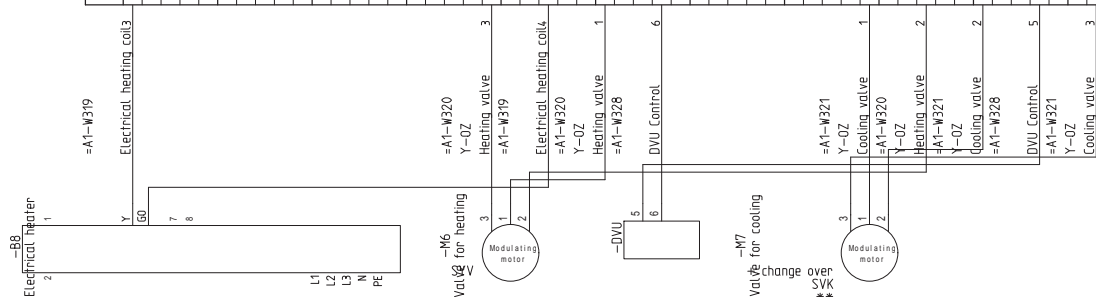
-X3

[illegible]

-X3

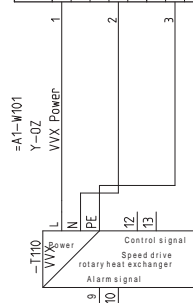
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|------------|------------|-------------------|-------|---|--|-------|--|----------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Terminal Strip | | | -X3 | | <div><div>-A1-W371.1</div><div>Caplarsensor bulb 2</div><div><div>-B8</div><div>Caplarsensor bulb 2</div></div></div> | | Path | | 187 F | | | | | | | | | | | | | | | | | | | |
| | | | | | | | Sheet | | | | | | | | | | | | | | | | | | | | | |
| Note | Cable type | Cable name | ----- Cable ----- | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | No. | Term. | Connection | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 40 | 0 | -K5A1 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | 0 | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | Project: | | Drawing no.: | | Rev.: | | Init.: | | | | | | | | | | | | | | | | | | | |
| | | | Date: | | 08-10-2014 | | | | Page: 97 | | | | | | | | | | | | | | | | | | | |

-X3

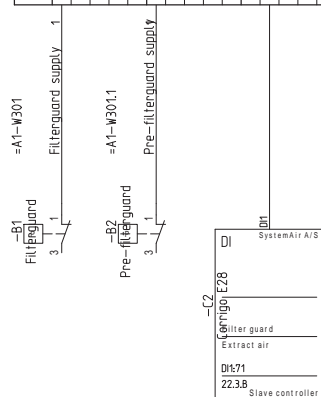


-X3

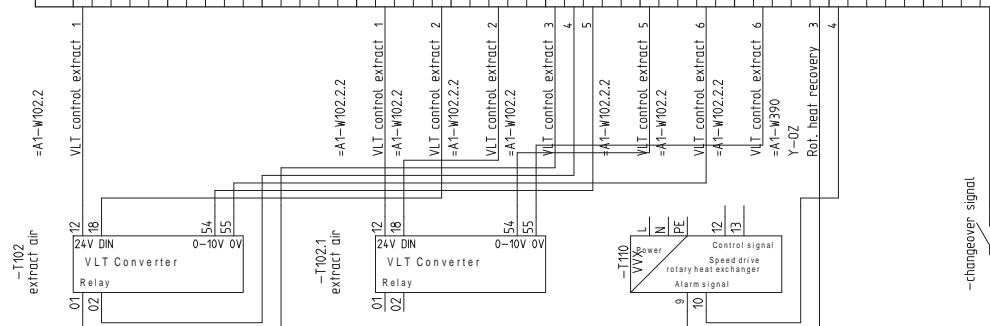
-X4

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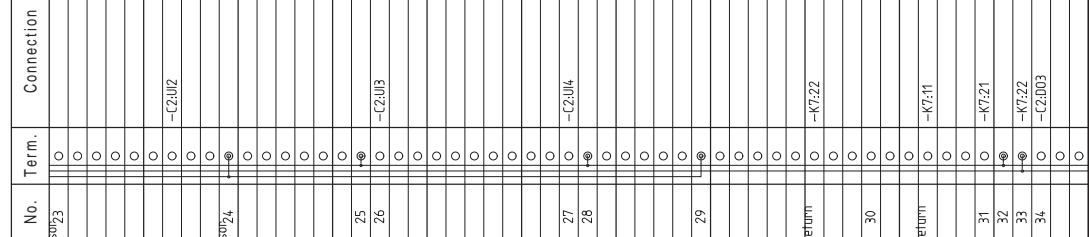
-X5



-X5



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|--|-----|----------------------------|--------------------------------|-------|--------|
|  | -X5 | Project: DV Control system | Drawing no.: 43000001;43000002 | Rev.: | Init.: |
| | | Date: 08-10-2014 | Page: 102 | | |



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|--|--|-----|-------------------|-------------------|-------|--------|
|  | | -XS | Project: | Drawing no.: | Rev.: | Init.: |
| | | | DV Control system | 43000001;43000002 | | |
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| | | | 08-10-2014 | | | 104 |

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